A COMPOSER'S GUIDE TO
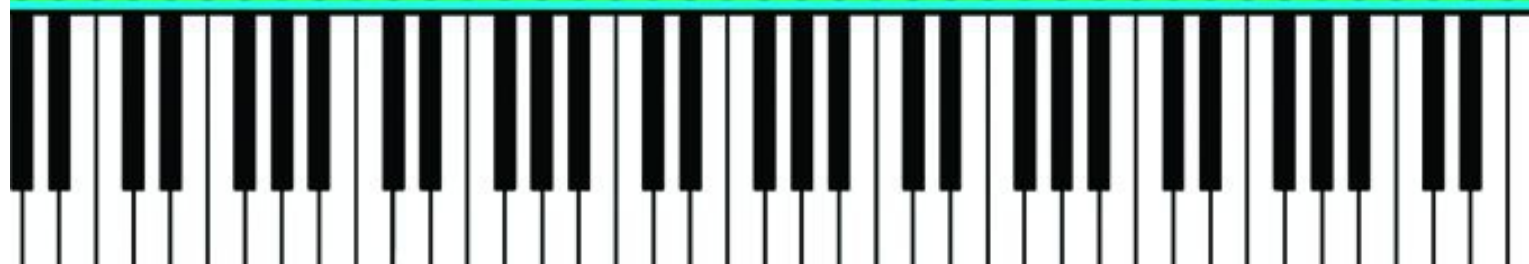# GAME MUSIC

WINIFRED PHILLIPS

A Composer's Guide to Game Music

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Winifred Phillips

Contents

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Why Would You Want to Write Music for Games?

The first time I thought about writing music for games was during protracted gameplay with the original *Tomb Raider*. Taking a break from pursuing ancient Atlantean artifacts among the ruins of Egypt, Greece, and Peru, I decided to let the game's star, Lara Croft, relax for a little while in her family manor. I had her swim a few laps in the pool. She went for a jog around the manicured estate. She hung out in the posh ballroom. Just for fun, I had her turn on her stereo, and some classically inspired music began to play.

This was the first time during my *Tomb Raider* experience that I'd had the opportunity to give the game's music my undivided attention. No need to solve puzzles or battle enemies here. I sat back, listened to the music for a while. Nice stuff, I thought. Then a persistent little idea began to niggle around in the back of my brain.

I could write music for games.

The forgotten PlayStation controller hung in my hand while that little thought kept getting bigger and bigger until it was shouting in my brain. *I could write music for games!*

If you are a musician/composer who is also a gamer, you may have already experienced a similar eureka moment. I remember mine like it was yesterday. Perhaps yours *was* yesterday. On the other hand, maybe you're a game composer with a few projects under your belt, and you can warmly recall your own eureka moment from the perspective of a blossoming career.

There is certainly a wealth of reasons why composers would be attracted to the field of video game composition, and not all of those reasons are motivated by the love of games. According to Reuters (Nayak and Baker 2012), video games were a $78 billion dollar industry in 2012. From all appearances, the video game industry has become an economic powerhouse. What better reason for a new wave of composers to turn their attention to games as a viable career path?

The career of a video game composer is incredibly exciting, but it's also a very difficult career. The field of video game development is a highly technical one, and this extends fully into the arena of music creation. Video game composers are required to master an array of specialized skills that are thoroughly foreign to composers in every other segment of the entertainment industry. What does a television or film composer need to know about creating a satisfying linear loop, or a dynamic mix based on vertical layering, or a set of music chunks for horizontal re-sequencing, or compositional fragments for use within a generative system?

As video game composers, we are required to twist our thought process to encompass probabilities and variables that are unique to video game design. Our music must be written with principles of fluidity and rules of reaction and interaction embedded in its compositional framework. On top of this, our music must connect with a listener's consciousness in ways that bear little relation to the methods through which film and television music connects with its audience.

Yet even with all these technical considerations in mind, our first responsibility is to create strong music that enhances the overall experience for the game player and contributes to the artistic quality of the project. In this regard, our job is not unlike that of any other composer in the entertainment industry; we simply have more details to consider.

Don't be discouraged if some of the concepts I just mentioned sound daunting to you; they will all be discussed over the course of this text, from the perspective of a fellow composer with experiences to share. Imagine that we are navigating the maze of the video game profession together, making our way through the twists and turns of this vibrant, demanding, and immensely rewarding career. Through this maze, I hope to be your guide. My first video game project was music for the action adventure game *God of War*. Since then, I've composed game music in a wide assortment of styles for many projects. Each of these projects was an incredible learning experience for me

and over the course of this book, I'll be doing my best to pass on what I've learned.

A Composer's Guide to Game Music is an exploration of issues relating to artistic inspiration within the confines of a game composer's profession. There are many excellent books that focus more directly on business and technical issues (you'll find them in the "Further Reading" section at the end of this book). While I will not be neglecting these subjects, my goal is to inspire creativity while pondering some big questions that confront game composers every day. How do we protect our artistic identities while working in a highly technical field? How can we harness our imaginations to meet the music needs of today's cutting-edge games without our own musical spirit becoming consumed by the technical constraints of the medium? While I don't pretend to offer definitive answers to these questions, I think they're certainly worth exploring.

Personality Assets of a Game Composer

As video game composers, we want to create great music. That's our first impulse. It's the reason we got excited about being game composers in the first place. We find video games to be fantastically inspiring, and we feel certain that we can create our best music in the field of video games. Let's spend some time thinking together about what it means to be creative as a video game composer, starting with a general overview that touches on a number of subjects we'll be exploring in more depth later on.

So, what are some of the personal qualities that are important assets to a successful game composer?

Asset #1: A love of video games

When I was a kid, I was fascinated by video games. I loved the idea that a piece of software could allow me to roam around a fully realized world, interacting with all manner of exotic characters while having adventures and doing brave deeds. I didn't care that the games I played when I was a kid tended to be a little rudimentary in their presentation, that their stories were somewhat simplistic, or that their gameplay was a bit repetitive. For me, video games were an escape unlike any other—the closest any kid would ever get to the fabled holodeck of *Star Trek* lore.

Game composers who were game geeks as kids can count themselves lucky. It's very important to have an enduring passion for games. Without a strong love for this medium, the day-to-day work will offer no enjoyment, inspiration, or fulfillment. This fact holds true for everyone in the industry (no matter what their discipline may be), and also serves as a reason why so many of the Internet job postings for game developer positions include phrases such as:

- Passionate player of games
- Strong interest in games
- An enthusiastic game player
- Exhaustive knowledge of games
- Gamer

For the aspiring game composer who *wasn't* a rabid gamer in his or her youth, there is no reason to be alarmed. Video games are no longer considered a club with an age limit. The results of a 2012 study from the Entertainment Software Association reveal that the average age of the most frequent game purchaser is thirty-five years old, and 37 percent of American gamers are over thirty-six. We can become gamers at any time in our lives.
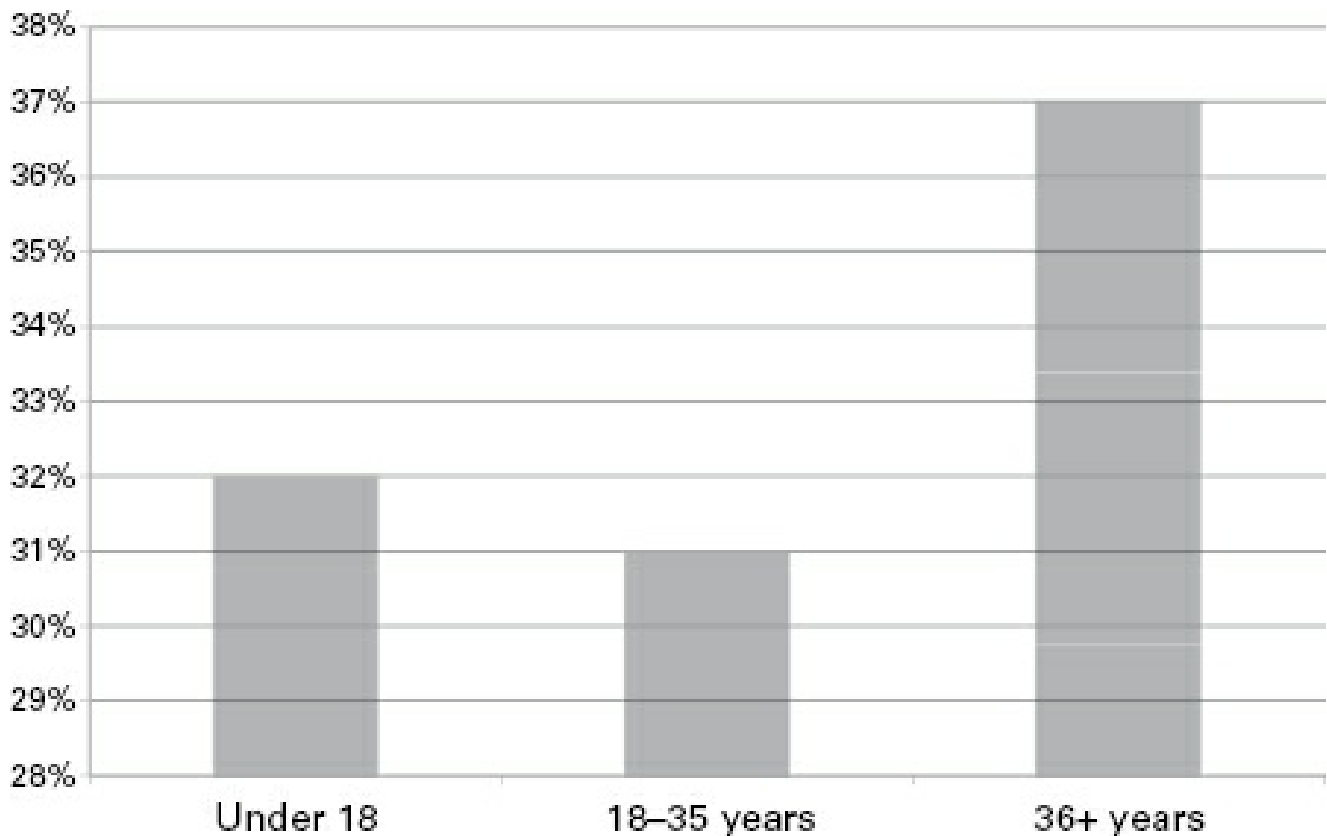
Figure 1.1
Age of game players in the United States, from the Entertainment Software Association's 2012 report on sales, demographic, and usage data.

To answer concerns about the high difficulty level in some modern console and PC games, I can offer even more good news. In recent years, some game developers have begun to recognize this problem and have included special settings that ease the difficulty level for new players. In an article for game industry site *Gamasutra,* editor Simon Parkin observes, "It is, almost without exception, preferable to design a game in such a way that beginners can find enjoyment on the low hanging branches, while those with ability to climb to the top of the tree are free to do so, and reap the rewards for their efforts" (2011).

Ideally, we should not only be gamers, but game *fans.* This kind of enthusiasm becomes the fuel that powers our creativity. It also helps us to feel included in a larger community. In an article for *The Journal of the Canadian Game Studies Association*, game developer Emma Westecott writes, "From playing, modding and machinima to art practice, blogging and literature, the range of fan activity in game culture continues to spiral in new and exciting ways" (2012). In other words, there has never been a better time to be a fan, or as many ways to express that enthusiasm, from subscribing to gaming magazines, to reading gaming blogs and bulletin boards, to forging friendships with fellow gamers who share the same passions.

Speaking of which . . .

Asset #2: An enjoyment of the quirkiness that defines the video game community

There is no way around it. Gamers are a unique bunch.

While I was attending the Game Developer's Conference in San Francisco in 2010, an odd sight struck me, forcing me to pause and stare. Four guys were playing what appeared to be some sort of multiplayer game on an Xbox set up in the exhibit area for Independent Games Festival nominees. The four guys had all carefully set their controllers down, and were taking deliberate paces backward. One, two, three, four, five. They watched the screen intently, as if waiting for instructions. Because of where I was standing, I never actually saw what the game told them to do, but I witnessed the result. With a howl of competitive glee, all four charged off in a mad race around the exhibit floor. Arms and legs flailing, they darted through the crowded exhibition space, completely oblivious to the amused attention they were drawing. For a time, they were too far away for me to see them, but I could hear their voices as they rounded their ad hoc racetrack, and I could hear people in the conference crowd reacting to them as they zipped by. Finally, after completing the circuit of the large room, they all leapt like a pack of wolves at their

controllers. Clearly one was determined to have won this absurd race, because the other three let out exaggerated groans while the victor stood, arms raised, like a prizefighter. Then all four guys dissolved into giddy laughter. The game was *B.U.T.T.O.N.*, otherwise known as *Brutally Unfair Tactics Totally OK Now*. Developed by Copenhagen Game Collective, the game was designed to elicit the exact reaction it was receiving at that moment: pure hilarity.

One of the things I love about the gaming community is its complete commitment to the things it loves. No shame, no timidity. Gamers don't do things halfway.

For a composer who enjoys a certain level of formality within the context of business conduct, the video game industry will come as a shock. Game developers are all full-blooded gamers. This can sometimes manifest itself in the form of rocker boots, game-inspired tattoos, and multicolored hair. Industry conventions and conferences typically include fully costumed game mascots, sword-wielding warrior women, and t-shirts fired out of cannons. This culture also extends into the field of game music. One prominent game composer is famous for dressing in public as a rhinestone cowboy. Another well-known composer recently dressed as a half-naked Grecian warrior while conducting a symphony orchestra in front of a screaming arena crowd.

I thoroughly enjoy gamer culture. It has the vivacity of a circus and the intensity of a war. Gamers love what they love, and hate what they hate, with equal fervor for both. Plus, gamers have formed one of the most Internet-savvy communities in existence. The gaming community is well versed in all methods of propagating its point of view as quickly as possible. Under these conditions, a small controversy can quickly erupt into a global event, sparking thousands on thousands of bulletin board threads, blog posts, tweets, and Facebook updates. Such is the power of gamer culture.

When we dedicate our professional lives to video game development, we must accept all the colorful, zany antics that go along with it. The happiest and most successful among us are those who derive pleasure from the pandemonium.

Asset #3: A desire to be on a creative frontier

Video games were born in 1958 when a scientist programmed an oscilloscope to play an interactive table tennis game (Kent 2001, 18). In contrast, films have a history that can trace its origin way back to 1832, with the invention of the first device capable of displaying moving pictures (Dirk 2012). The video game industry is 126 years younger than the film industry. However, despite its massive head start, the film industry is now being compared to the game industry and is coming up short. Publications such as *The Guardian* (Graham 2011) have asserted that "Games are overtaking films in terms of sophistication" and *Entertainment Weekly* (Vary 2011) has stated, "Taken in total, the big movies of the last few years have rarely been as *interesting* . . . as the big videogames of the last few years."

The fact that our industry has come such a long way in such a relatively short time is an indication of the rapid rate of innovation and advancement. Video game graphics started with simple geometrical shapes in a two-dimensional environment. Fifty-five years later, game graphics are now depicting complex and realistic objects containing tens of thousands of polygons, and environments that can be fully explored in all three dimensions. The simple physics calculations of early games have now matured into sophisticated systems incorporating such object characteristics as density, buoyancy, and friction in order to create environments that behave in realistic ways when manipulated and disintegrate realistically when destroyed. Game audio, which began as simple electronic tones, is now typified by CD-quality sound in both stereo and multiple surround configurations. Sound effects are now altered by such in-game conditions as weather and environment. Full-scale musical scores are written in both traditional and interactive formats to fully engage the listener.

For video game composers, it's a frontier that can sometimes feel as uncertain as the Wild West. There seem to be as many approaches to game audio development as there are game development companies. Advancements in hardware and software combine to drive the industry in unexpected directions. Every few years, the big three console manufacturers release the next iterations of their consoles, and the technical specifications of those consoles invariably cause huge ripples across the industry, fundamentally changing the way developers make their games. For PC games development, such changes occur with even greater frequency, as possibilities are expanded by the capabilities of each new generation of graphics cards and CPUs.

Video game development is a craft poised on a creative frontier. The game development community is filled with ambitious mavericks, ready to blaze new trails. As composers, we can be thoroughly happy and fulfilled as a part of this community. However, we should make sure that we're comfortable with the idea of creating our art in an unpredictable, high-tech environment.

While we're on the subject . . .

Asset #4: A fearless attitude toward technology

The days of pure pencil-and-paper music composition are gone for good. If we wish to compose music in modern times, we must be able to navigate the wonderful world of computers and technology. This is true for *any* kind of composer, whether that be a pop songwriter, a creator of music for instrumental groups and orchestras, a composer for television and film, or a game composer (in fact, it is *especially* true for game composers, but more on that later). Whatever our chosen application of our art, we'll either need to be blessed with a large music production budget or we'll need to embrace technology in our professional lives.

As an example, let's say that we have just completed a piece of music. Unless the music is for a soloist, we'll need to hire at least a few talented musicians (or simulate them using instrument sample libraries triggered by software samplers). If we decide to hire musicians, it is usually expected that our music notation will look typeset, requiring us to hire a copyist (unless we can do it ourselves using notation software). If we'd like to record the performances of those musicians, we'll have to hire a recording engineer and studio (unless we have a studio and are proficient with Digital Audio Workstation software). Most of us are not lucky enough to work with large production budgets enabling the hiring of musicians, copyists, recording engineers, and production studios. With this in mind, it becomes vitally important for us to be proficient in modern music technologies.

Moving beyond these baseline requirements, as a game composer there are a few more pieces of the technology puzzle. These include additional specialized software applications specific to the field of game audio (we'll be discussing these in more detail in chapter 13). These software packages allow game composers to apply interactive behaviors to their music and preview how those behaviors will function within the framework of a game.

Taken as a whole, all of these technical requirements can seem pretty scary. If we are to be successful game composers, we have to fight back the initial dread, sit down with the product manuals, and then dive headfirst into the hi-tech pool. Developing a comfort level with the available tools will allow us to create music for these marvels of modern science we call video games. Anything that can get us closer to our goal of composing for games is a blessing, however complicated it might seem at first.

Still, despite all of the tools and technologies, in our hearts we always put the music first.

Asset #5: A passion for music composition

While this quality doesn't distinguish us as game composers, in our field it becomes especially significant. In fact, it is best for us to have a primal *need* to create music. This passion for our profession will carry us through both good times and bad, offering solace and joy whenever we have need. Working in the game industry requires a lot of determination and stamina. Our *need* to compose can go a long way toward affording us the staying power that is a prerequisite to success.

Like the rest of the video game development community, game composers work long hours without consideration for weekends or holidays. The career of a game composer can be physically, mentally, and emotionally exhausting. If we don't have a driving desire to create music, the daily grind is likely to burn us out.

Here's one of the most dreaded phrases in the game industry: "crunch time." This term is defined as unpaid overtime, usually invoked when a deadline is fast approaching. The practice is a highly controversial, unavoidable reality in our industry, and it impacts everyone working on a game project, including the composer.

Crunch time may not be particularly special to our industry, according to Frontier Developments founder David Braben: "Any product related business tends to have crunch whether it's making hardware or shipping devices. Motivation is the challenge" (Williams 2011). The game industry takes this a step further, though, as crunch may be intrinsic to it—if we accept the assertion of journalist Rus McLaughlin (2011) when he states, "The game industry regards crunch time as a sacred institution, not unlike marriage. If you're in love, you do it, and either your bond grows stronger, or it ends in a messy divorce."

While we can count on our passion for music to help us through the hard times, it is also vital in the best of times as well. With the right spark of enthusiasm, the process of writing music for games can be positively exhilarating. Pablo Picasso once said, "Inspiration exists, but it has to find you working" (Andries 2008, 198). I can think of no activity that is more demanding of a composer's skills and ideas than game music composition; inspiration has ample opportunity to find a game composer hard at work! From my own experience, I've found that the busiest times in my career have also been the times filled with the most creative growth.

On the other hand, when we're just starting out in our careers, that burning desire to create music can translate into pure frustration. Without the benefit of a project to which we can apply our labors, the persistent need to create can drive us crazy. Still, we should remember that having too much passion is sometimes a very good problem to have. Until we land our first jobs and officially call ourselves game composers for the first time, we can always apply that frustrated passion to the business side of our careers (more on this in chapter 14).

Asset #6: The determination of a small business owner

Being a composer is a solitary profession, requiring long periods of isolation. With this in mind, people may imagine composers to be quietly introspective souls, focusing more on their inner muses than on the outside world. Perhaps this is at least somewhat true; we may all have within us our own inner hermits, eating and breathing for music alone. Regardless of whether there is any truth to it, we should be careful not to romanticize the tendency. It can often be more of a liability than an asset.

All game composers must be salespeople at one point or another in their professional lives. Even in-house composers, momentarily secure in their salaries and benefits, will inevitably face the harsh reality of this industry's high employee turnover rates and find themselves selling their services. Salespeople can't afford to be shy.

I am a contract composer. Independent contractors like myself are defined as people operating their own businesses, responsible for the creative, financial, technical, promotional, and administrative affairs of their companies. At the beginning of a game composer's career, this isn't particularly complex. As the career blossoms and matures, however, the business demands become greater. From entering into non-disclosure agreements, negotiating game contracts, issuing invoices and monitoring payments, to attending conferences, conducting business meetings, giving interviews and running promotional campaigns, the non-musical side of the profession can become overwhelming.

However, if you enjoy the challenge of running a small business and are determined to succeed, you can find ways to support and promote your budding enterprise while also having some fun in the process. I've had a lot of different experiences as a small business owner (which I'll discuss further in chapter 14) but one of those experiences stands out in my memory and makes me smile. In the spring of 2008, I was juggling music composition work on one game project while simultaneously promoting another recently released game for which I'd composed the music. Through various PR efforts, I'd been able to establish contact with a journalist at *Play Magazine*. I'd hoped to set up an interview that might serve to promote the game that had just hit store shelves. As it turned out, the magazine wasn't interested in any further coverage of that game, since it had previously received some prerelease coverage and had already hit retail. The timing wasn't right, things weren't looking good, and it might have ended there. Then the *Play Magazine* journalist asked me if I had anything else I could talk about . . . possibly something that hadn't yet been released? I immediately thought of the game I was currently working on, *The Maw*. It would be the first game release of developer Twisted Pixel Games, a brand new development studio creating games for Xbox Live Arcade. *The Maw* was a downloadable title and at the time it had received no press. The *Play Magazine* journalist hadn't heard anything about it, but he was intrigued. I introduced the guys at Twisted Pixel Games to my contact at *Play*, prepared photos for the article, music files for *Play* to hear, and a gameplay video that demonstrated the music implementation design in action. I also helped facilitate communication between *Play* and Twisted Pixel as they delivered concept art and early playable builds of the game.

When the July 2008 issue of *Play Magazine* came out, it included a beautiful full-spread feature devoted to *The Maw.* The article provided invaluable exposure for both the game and the fledgling development studio that had created it. Plus, the article included a short paragraph about my musical contribution to the project (as a sidebar), so it was a win-win situation for everyone. The game went on to attract lots more press attention and awards recognition, including the Audience Choice Award in the 2008 "PAX-10" showcase at the Penny Arcade Expo. When the game was released, it shot to the number one bestseller position on Xbox Live Arcade.

The success of *The Maw* is entirely due to the creativity and determination of the team at Twisted Pixel Games, but I like to think that I was able to help them in a small way that was magnified by lucky timing. As game composers, we very rarely find ourselves in a position to offer that kind of assistance, so I count this as one of my fonder memories connected with the business side of my profession.

Asset #7: The desire to contribute to a new art form

Video games can often be a contentious subject in discussions of what constitutes art. In any discussion of art, the inherently subjective nature of the topic can muddy the waters. This is true regardless of whether the discussion is

about a painting, a stage play, a novel, a film, or a video game. The term "art" means different things to different people.

Given the importance of the issue, we'll be returning to it several times over the course of this book, but for now, let's consider what it would mean for game composers if we could conclusively prove that video games are truly works of art. As composers, our art is our music, and we are driven by an ambition to create something meaningful, memorable, and emotionally resonant with each piece of music we compose. Wouldn't it be amazing to create that kind of music for a revolutionary new art form?

Oscar-nominated film director Guillermo Del Toro thinks that games are the art form of the future. "We are in the infancy of people recognizing video games as art," Del Toro says. "In order to be a storyteller in the 21st century, we urgently need to learn to tell stories through video games" (Nakashima 2011). Likewise, University of Wisconsin Professor James Paul Gee believes that video games are "a new form of performance art coproduced by players and game designers." As the author of the book *Why Video Games Are Good for Your Soul*, Gee perceives video games as offering much more than an engaging way to pass the time: They are "a form that has the potential to integrate pleasure, learning, reflection, and expanded living in ways that we expect from art" (Gee 2006).

Perhaps the most important aspect of the debate is the outpouring of responses from the video game industry to any claim that games can't be considered art. At the University of Southern California's TEDx event in 2009, the high-profile speech "Stop the Debate: Video Games Are Art, So What's Next?" by game producer Kellee Santiago became a perfect example of this ardent support of the expressive possibilities of video games. As the creator of the critically acclaimed video game *Journey* and the former president of the *thatgamecompany* development studio, Santiago has strong opinions about the future of games. "As an artistic medium, they'll become more powerful in the 21st century than radio, film and television combined," Santiago contends. "I do think that we are on the precipice of an extremely exciting time right now, and that this is an amazing opportunity that we're being given here."

As game composers, we should embrace the spirit of experimentation and optimism that is such an integral part of the video game development community. Our work sometimes demands that we create entirely new ways of musically conveying our ideas, but this is fitting for music that will become part of a revolutionary new art form. We should be willing to throw ourselves wholeheartedly into the pursuit of creative expression, creating works that aspire to the status of high art, and betting that our colleagues in the game development community will do the same. And speaking of bets . . .

Asset #8: The spirit of a gambler

There is no shortage of experts willing to discuss the innate qualities of a successful entrepreneur, but none state their case in so pithy and direct a manner as Professor Howard H. Stevenson of Harvard Business School when he says, "Entrepreneurship is the pursuit of opportunity beyond resources currently controlled" (Rodrik 2012). To me, this translates roughly as "When you're chasing success, don't be afraid to gamble."

As game composers, we are constantly gambling. For the most part, the stakes consist of our time, as we create demonstration music without compensation, solely for the purpose of convincing a developer that we are right for their project. In this way, we are incessantly wagering our time and effort on the possibility that we might exceed the competition and be selected for that coveted job. Sometimes it can feel like being a prospector in the Wild West, hoping to strike gold (at least in a figurative sense).

Then there are the situations when we are literally gambling with out-of-pocket money. It can be very expensive to keep ourselves competitive by upgrading, updating, and overhauling our production studios on a regular basis. Factor in the business trips to meet up with potential clients, and eleventh hour software purchases designed to enable more effective bids for potential jobs, and it all adds up. In addition, our profession offers no benefits, and our incomes have the potential to vary wildly from year to year.

The truth is that we have to be willing to gamble with our time and money in order to remain viable in the video game industry. For those of us who get nervous about this sort of gambling, the daily choices can become agonizing. Much better to look at each gamble as a game, with risks and rewards that closely resemble the video games we love. I'll admit that I've had my moments of nausea when making the big expenditures while inhabiting an income vacuum. It's always terrible to see the money going out when it isn't coming in. But when we think of it in terms of video games, then these sorts of choices sting far less. Sometimes we have to walk into that boss battle, knowing that we are going to lose a ton of hit points, in the hopes that we'll survive to the end and emerge with a ton of great

loot. In our case, the loot is a great opportunity to create music for a wonderful game, collaborating with a fantastic group of developers, which brings us to:

Asset #9: The desire to be part of a great team

Game development is a team sport. The culture of game development is focused sharply on collaboration. Many development companies abhor the usual corporate structure of overseers in their offices and subordinates huddled in cubicles, opting instead to put everyone in a large open room where they can constantly peer over each other's shoulders and compare notes. This environment facilitates open dialogue, spirited teamwork, and free-for-all shouting matches. If passion breeds excellence, then game developers are among the most excellent people you're likely to meet.

A beloved tradition in the game industry is the *rant*. It takes place at many game industry events, most notably at the Game Developers Conference in San Francisco each year. Rants tend to be well attended because they also tend to be very entertaining. I remember one rant that was so well attended that the audience spilled out into the corridor and sat in a large crowd on the floor, listening to a rant they could not see. In a typical rant, a notable game developer will mount the stage, step up to the podium, and let forth with an onslaught of angst and (sometimes obscenity-laced) rage about some topic of contention in the industry. The very best rants include outrageous condemnations of current industry practices and predictions of doom and destruction should we continue on our current path.

What impresses me most during these rants is not the passion of the speakers (although there is no shortage of that), but the ardent and devoted support of the game developer audience. They don't behave like colleagues who have gathered to hear an important address. They behave like fans in a sports stadium, cheering one of their MVPs, their voices filled with team spirit.

Game development team members spend extraordinary amounts of time with each other over the course of a project. This is especially true in crunch, during which a development team may almost completely forfeit their lives in favor of their work. In an extreme example of this phenomenon, one game company reputedly spread out mattresses in an unoccupied room so that their team members could grab quick naps and then return to their desks to work around the clock (Sheffield 2010, 9). This is only one of many such war stories, and it is easy to imagine how these game development warriors might feel as though their coworkers have supplanted their families and friends, considering how much they see of the former and how little of the latter.

Where does this leave us, as game composers? A few of us are in-house, salaried employees spending our days hunkered down in soundproofed studios, somewhat isolated from the rest of the team. The large majority of us are completely off-site contractors. We schedule in-person visits whenever possible, and otherwise rely on communication by phone, e-mail, chat, and (more recently) various social networks like Facebook and Twitter. Whether we're in-house or off-site, it's vitally important to stay in close contact. I'll be going into more depth regarding team members and our role in the team in chapter 8.

There is nothing like being a part of an inspirational team, and there are great ways for a composer to assimilate more fully, whether we are on-site or working at a distance. The important thing to remember is that we must nurture in ourselves the desire to be a part of the team, rather than see ourselves as contributing autonomously to a collective venture. Our commitment to team spirit will be of great benefit, both to the quality of our work and to the overall quality of the game. In fact, it is entirely possible for us to be so fired up by the team's excitement that we create music that inspires the team to revise and improve their game. This constitutes a full circle of enthusiasm that, to my mind, is one of the most fulfilling perks of the profession.

So, Why Would You Want to Write Music for Games?

We've just taken a brisk tour of some important concepts that we'll explore later in greater detail. Hopefully this overview has helped us to gain a general sense of the game industry and our place in it. So now that we have explored the reasons why we might want to write music for games and the personality traits that would be assets to us in this industry, we should now ask, does our contribution matter? Is music important in games?

Describing the history of game audio in her paper "From Bits to Hits: Video Games Music Changes Its Tune," researcher Karen Collins writes, "As sound technology improved through the last three decades, so did its role in games. Music quickly went from being a catchy gimmick designed to sucker quarters from unsuspecting passers-by

in arcades, to being an integral part of the gaming experience" (2005, 4).

Steve Schnur, worldwide executive of music and marketing for game publisher Electronic Arts, describes game music as "the reason for the emotional response that games never had 10 to 20 years ago" (Schweitzer 2008, AR31).

"Gamers care a great deal about the music in games," says Emily Reese, on-air host for Classical Minnesota Public Radio and creator of MPR's *Top Score* podcast, covering all aspects of video game music. "It absolutely influences and informs almost every decision you make as a gamer" (Child 2012).

Game music matters, and with each new game release our contribution becomes more and more significant. Game music composition is a fascinating, difficult, and tremendously rewarding career. As game composers, we are joining a community of rebels, fanatics, and geniuses. With every game release, these creative souls show us new wonders we couldn't have imagined before. Their games light up our PC and console screens, each like a brand-new kind of firework, exploding in sparks for our amusement and delight. Hopefully those sparks of inspiration will join with our own, and our music will add new shades of color to their pyrotechnics.

In the next chapter, we'll discuss the creative tools we can use as we attempt to create the most effective game music possible.

2

A Composer's Creative Skillset

Among the bric-a-brac scattered around my house is a big feather quill. It has a very impressive-looking brown feather, and is purely decorative. I sometimes look at it and think about all those great historical composers, slaving away with their feather quills. Then I head off to begin my creative day in a studio full of so many buttons and blinking lights that I might as well be working at NASA.

As modern day composers, we are often forced to remind ourselves that we aren't primarily button pushers. Our tech expertise is not what makes us what we are. We have talents that help us coax the soul of music out of the heart of the machine. Before we ever boot up a computer, we rely on a set of skills that help us to create melody, harmony, and rhythm in just the right combinations to evoke emotion in our listeners, creating a memorable aural experience. So, let's talk about those skills, and how aspiring game composers can best obtain them and capitalize on them.

A Musical Education

Sarah Caldwell, the first female conductor at the Metropolitan Opera, once said, "Learn everything you can, anytime you can, from anyone you can" (GoodReads 2012). When considering the importance of a music education in the life of a game composer, Sarah Caldwell's advice is well taken. In my experience, some of the most valuable knowledge comes from unexpected places, making it very important to be eager to learn, no matter the circumstances.

When seeking a musical education, there are three choices for the aspiring composer. Let's explore the benefits and drawbacks of each choice.

Education via a Formal Institution

As a more traditional choice for the aspiring composer, pursuing a higher education in music composition can provide invaluable skills and experience, but the options can be confusing. There are currently no degrees that focus specifically on video game composition, although a few schools offer game music courses as part of their more conventional music composition programs. Some of these schools include Berklee College of Music, Yale University, New York University, and the New England Conservatory. Each of these programs offers a rigorous foundation in theory and composition techniques, including numerous opportunities for student compositions to be performed by the institution's various instrumental ensembles.

There are possible advantages to selecting an institution of higher learning that has both a strong music program and a strong video game design program. This choice can position an aspiring game composer to collaborate with aspiring game developers within that same institution. The opportunity to put abstract knowledge to concrete use is invaluable. It may be advantageous to be in close proximity to student developers who will possibly have use of our skills. In fact, the need for a composer's skills in a student environment can be crucial, particularly in the case of game development competitions that are open only to students of higher learning institutions. These include the Imagine Cup sponsored by Microsoft, the Independent Games Festival Student Showcase, and the Dare to Be Digital event in which student teams compete for the chance to win a "One to Watch" award from the British Academy of Film and Television Arts. In order to be competitive, these student teams need a composer to take their entries to the next level.

Regardless of such considerations, when making the difficult choice between institutions of higher education, we should try not to forget that our personal impression of the professors is important. These people will shape our understanding of our chosen profession, and their subjective viewpoint and aesthetic sense may have profound

effects on the future of our creative lives. We can further our understanding of these professors by listening to their compositions. We can also read their published academic papers and conduct research online. Pursuing a degree is a very serious undertaking, but it also has the potential to reap serious rewards for the dedicated student, both in terms of personal enrichment and in opportunities to meet the game developers of tomorrow.

That being said, many who have become successful in this field did so without a music composition degree. Some had degrees in instrumental performance, while others entered the profession after achieving success in rock bands or the world of electronica. Still others found success as game composers after obtaining degrees in very different professions, and then subsequently discovering their passion for game music. It is possible to acquire a strong education without a formal degree, but it is more difficult. The two main paths to knowledge are private instruction, and self-directed learning (otherwise known as being *self-taught)*.

Private Lessons

Private lessons in music composition offer many of the benefits afforded by the classroom setting with the added advantage of one-on-one instruction. However, finding a teacher with the knowledge, experience, and enthusiasm required for giving such lessons can be challenging. For those of us located conveniently near a university or conservatory, there is the option of taking private instruction with professors at that institution. Otherwise, a diligent search through our local resources will be required to find a teacher who will meet our needs. For some of us, our search for private instruction will focus on very specific gaps in our education. In these circumstances, private instruction can be an ideal solution to an otherwise insoluble problem.

Here is an example: I was a teenager when I got my first keyboard. I'd already enjoyed the benefits of a good education in both piano and voice, and was beginning to pursue a traditional education in music composition. None of this helped me figure out what to make of this new keyboard device. It was a beautiful thing with a silky black finish, and had been displayed in a place of honor at my local musical instrument store. I peered in wonder at all of its numerous buttons. I poked a few of them randomly, manipulated a slider, and peered at the softly glowing LCD screen positioned above the keys. I had no idea what I was doing, but I couldn't have been happier. This modern marvel would empower me to forge bravely into my future as a composer!

The keyboard came with special five pin cables labeled *MIDI*, and other dedicated audio cables designated *TRS*. I had no idea what any of those letters stood for. (The *Tip Ring Sleeve,* a.k.a. TRS, is a common connector for analog audio cables, and we'll be discussing Musical Instrument Digital Interface, a.k.a. MIDI, in chapter 12.) Plus, I had obtained a modest mixer (which I wrongly believed would be intuitive to understand), and a much more arcane device called a *rack module*. This magical thing would communicate somehow with the keyboard, delivering a world of additional sounds that I could use for my compositions. I was very excited! Later, sitting on the floor at home with my new prizes spread out around me in all their component bits and pieces, my euphoria slowly waned. Nothing in my previous schooling had prepared me for my current conundrum. I'd thought that these wonderful toys would open up a world of possibility for a budding composer like myself, but now I couldn't imagine any possibility of getting it all to work, much less composing anything with it.

I was fortunate in that I was able to obtain private lessons with a local composer who subsidized his passion by working in a music store. This combination resulted in some wonderful lessons, covering both technology and music composition. Through these lessons, I first became aware of a basic truth that has stayed with me over the years:

When we introduce any new technology into the process of creation, it fundamentally changes that process.

My comprehension of this concept began while learning how to interact with my rudimentary keyboard. The assortment of sounds available to me via the keyboard's memory, coupled with the limitations of the modest sequencer's polyphony, forced me to focus only on what I could achieve with the tools at my disposal. Over the years, as I expanded those tools and slowly built the studio I own today, I have watched my composition style shift in subtle ways to adapt to the changing capabilities of my instruments.

This is not a new concept to the world of music composition. Throughout history, as new instruments were invented, compositions began to appear for them. As existing instruments were refined, their capabilities expanded and enhanced, so too did composers adjust their creative output to take advantage of the potential that these changes afforded. The main difference today is the speed with which these changes are introduced, refined, and implemented in modern music. I'm very grateful to have had a good initial instructor with the expertise of both a composer and a technician. He provided me with a strong introduction to this mode of composition, which gave me

a foundation on which I could build as I continued to learn in both formal classrooms and informal settings.

Private instruction can offer wonderful benefits, and a composer might conceivably obtain an entire education in this way. However, the expense would doubtless be very great, and there is yet another option to consider.

Self-Directed Learning

This may be the most challenging option, but those of us who are vigorous self-starters, who are able to achieve goals without supervision or external motivation, might be attracted to this method of learning. In fact, possessing such qualities is very desirable when embarking on a life as a video game composer (particularly as an independent contractor). Most of us will spend our careers as self-employed businesspeople, and self-starters make great entrepreneurs.

One of the most celebrated self-taught composers in the video game industry is Nobuo Uematsu. Without taking lessons in any instrument or receiving music instruction at any formal institution, Uematsu has risen to the pinnacle of the field of video game music. His career began very simply. He was working at a music rental shop in Tokyo. At night he would meet up with a bunch of his friends, and they would share their big dreams for their futures. One of these friends happened to be an employee from a game company called Square. She invited him to create music for some of the company's ongoing projects. He agreed, but never thought it would amount to anything more than a short-lived side job. Over fifty games later, Uematsu has become a legend in the game community (Mielke 2008).

A few years ago, I attended a concert performance of video game music that included one of his most beloved pieces. A video game music performance is an experience that can't be compared with any other in the field of concert music. Costumed game characters often wander among attendees. It's likely these colorful characters are members of the paying audience who were inspired to go to the concert as their favorite game hero or heroine. Like full-grown trick-or-treaters, these people bring a spirit of child-like anticipation and delight to the proceedings. It's hard to maintain the sophistication of an orchestral concert attendee when much of the audience is as pumped as a mosh pit. Big cheers go up when each piece is announced, and those cheers are repeated when the most recognizable themes are sounded. When the slower atmospheric pieces play, cell phones light up the faces of the spectators as they wave the glowing screens back and forth over their heads en masse. New surges of excitement spread throughout the crowd as each new piece is played, but there is an undertone of giddy anticipation for the finale of the concert: the pièce de résistance.

Although I attended the video game music concert with the Uematsu finale a few years back, I can still vividly recall the anticipation of the crowd as the orchestra prepared for its final performance. When the last piece began, the frenzy started building. As the anxious orchestral arrangement alternated between terrified dissonance and heroic clarion calls, the music rushed toward an outcome that everyone knew was coming. When the singers lifted their voices, the audience raised a deafening roar that almost drowned out the choir as they sang out the name of the video game villain, *Sephiroth*. The piece was "One Winged Angel," the climactic track in the game *Final Fantasy VII*. Released in 1997, the game was an international blockbuster, and cemented the fame of the self-taught Japanese composer. The reaction of the audience at the concert I just described was not at all unusual. Uematsu's music has been performed around the world, with similar results. His career and profound success stand as proof that a self-directed learner can achieve great things in the world of video game music.

Nevertheless, it is not an easy road. Self-taught composers do not have the luxury of a guide to direct them toward the resources that would be most informative or reliable. Also, the agonies of trial and error have the potential to assail the self-directed learner with greater frequency. Therefore, the independent learner must have a voracious appetite for reading, and an ability to internalize abstract knowledge and translate it into practical applications. Self-taught composers obtain expertise through books and through their own innate ability to listen to great music and recognize its strengths, sinking below the surface layers to examine and comprehend the mechanics beneath. In fact, whether we are self-taught, or gain our knowledge through private lessons or formal institutions, the ability to aurally dissect what we hear is an invaluable skill. This leads me to our next topic of discussion.

Music Appreciation

We've most likely all heard of this topic as it relates to the university and high school courses bearing its title. In the context of such coursework, music appreciation often consists of a chronological overview aiming to place great musical works within a historical framework. For our purposes here, music appreciation is the ability to hear the

mechanism behind the apparent effect; that is, to appreciate what's going on beneath the surface.

In 1939, composer Aaron Copland summed up this concept very succinctly in his book *What to Listen For in Music*. In the book, Copland asks two questions:

1. Are you hearing everything that is going on?

2. Are you really being sensitive to it? (xxxiv)

These are profound questions, requiring some soul searching. Prejudices can sometimes get in the way of true sensitivity, in which case it becomes necessary for us to divorce ourselves from our genre loyalties. We all know what we like when we hear it, but those preferences can interfere with our ability to truly *listen*. When I'm listening to a piece of music for the first time, I do my best to remain unaffiliated with any particular musical allegiance. Whether it's thrash metal, *musique concréte*, organ fugue, or teen pop, I want my ears to be ready to receive it.

To my mind, this is a vital skill to cultivate as a working game composer. We never know what musical genre we'll be asked to deliver, and sometimes we'll find ourselves working on projects that require several genres, or even *many*. We can't write in a musical genre that we hate. Either we turn down the gig or set aside our emotions and listen for some musical element in that genre that tickles our interest. If we listen carefully enough, there will *always* be some technique or effect that will intrigue us. Because we're composers, music by its very nature is fascinating to us. We can't help but find some kernel of cleverness in any musical genre. In fact, we should look on the whole process as an enjoyable treasure hunt.

Keeping that in mind, it becomes possible for us to commit ourselves fully to the task of listening to a piece of music, regardless of its nature. For recorded music, I personally prefer listening through a pair of high-quality headphones, because they allow me to perceive subtle details that are sometimes not as apparent through speakers. First, I attempt to pick apart the arrangement, identifying instruments and following their activities. In most stereo recordings, the individual instruments of an ensemble are each positioned at a particular point in the stereo spectrum, which spans from the extreme left to the extreme right. Stereo placement helps a great deal in pinpointing these discrete components; spatial relationships help separate elements from one another in the mix and make it possible to take note of rhythms and pitches in the individual instruments.

At this point I take a mental step back so that I can see the larger picture, like backing away from a pointillist painting in order to see the shapes formed by all the little dots of paint. From this perspective, the foundation and structure of the music begins to become apparent, complete with all its pacing choices, emotional effects, tone colors, techniques, and devices. Such listening sessions, at their best, feel to me as though I were looking at an architectural blueprint, displaying not only the design of the structure, but the way in which it was meant to be used —its core philosophy.

While it is certainly possible to achieve some of these results by reading sheet music, this may fail to deliver those emotional responses that can help lead to the sense of musical enlightenment we are seeking when we listen. Plus, many of the tracks that we might want to examine in this way lack any published sheet music. This is another reason why we should attempt to train our ears to be sensitive, unbiased, and curious.

While we're on the subject, let's talk for a little bit about the more formal discipline of ear training, and how this might be implemented most effectively in the creative process of a video game composer. Ear training is commonly defined as the course of study whereby we obtain the ability to identify musical elements such as intervals, harmonies, pitches, rhythms, and other rudimentary components of musical structure by ear. This is an excellent skill to possess, and I suspect that many of us become initially acquainted with this discipline when we learn our primary musical instruments and begin performing in ensembles. If we're lucky enough to have an innate musicality, then we're prone to absorb these concepts fairly naturally. I'd like to narrow the scope of this topic and focus on the concept of *tone color,* because I believe it to have particular significance in the creative process of a game composer.

Tone color has been defined to include many qualities of sound, including pitch, attack, decay, frequency, harmonics, vibrato, etc. Discussing the definition of tone color can become an involved process, so let's keep things simple and to the point. For our purposes, let's define tone color as the intrinsic quality of a sound that differentiates it from the other sounds around it. For instance, a flute and a violin may both play the same pitch, at the same loudness, for the same duration; but our ears will be able to distinguish the flute from the violin because the instruments have different fundamental tone colors. This is also true for a pair of synthetic tones, such as a square wav and a sine wav, or even a pair of non-musical sounds, such as a boot stamping on concrete and a loafer stamping on wood. The sounds are different, and our ears can tell that difference right away.

When we focus on tone color when listening, we in turn enhance our ability to listen sensitively to new tracks. Tone color can be of enormous assistance when we are attempting to aurally dissect a track and determine its structure. Beyond this, however, is a practical application of tone color to the process of a game composer. Often, our music will be literally dissected, much in the way that we attempt to mentally scrutinize tracks by pulling apart their elements. A game composer will sometimes be asked to literally pull their compositions apart in order for them to be structured interactively. Without going too deeply into a subject that we'll be exploring later in this book, I'd like to emphasize that an understanding of tone color can help us as game composers to structure our compositions so that they can be satisfactorily disassembled and then reassembled by the game's audio engine.

The tone colors of various instruments determine their *place* in the overall ensemble. The pieces of the puzzle fit together because the prudent composer has arranged the instruments so that each tone color has its designated place in the structure of the composition. Yet when we disassemble the composition, the resulting pieces may feel orphaned and vulnerable, stripped of their essential supporting structures. A thorough understanding of tone color can help us prevent this. By recognizing that certain subsections of our composition will be isolated from the whole, we can arrange those subsections so that a satisfactory balance of tone colors exists within them. In doing so, we may carefully introduce some subtle "darker" tones that help to establish a supporting foundation as well as "brighter" tones that bring life to this subsection of the composition.

If this concept seems confusing, don't worry—chapters 11 and 12 will be addressing issues related to interactivity in much greater detail. For now, let's just consider the idea that tone color may play a unique role in the creative thought process of a game composer. It can help us develop a deeper understanding of both our own work and the works of other composers.

As an aside to this discussion of sensitive listening, I would like to mention the very important (but often contentious) practice of using reference works. This involves the placement of temporary pieces of music within a work of visual media (such as a film, a television program, a video game, etc). Everyone involved understands that these preexisting pieces of music will not be licensed for use in the final product. They are placed temporarily in order to test musical styles against other features, such as visuals, sound effects, and dialogue. This practice becomes a concern to us as composers when we are asked to mimic the structure and feel of the reference track.

Some composers react very negatively to this, for understandable reasons. When we are asked to imitate others, our own creative freedom is limited. Still, we should try and understand why we might be asked to do this. The musical style in the reference track has been placed successfully in the visual media work, tested thoroughly in that context, and proven to be effective. Asking the composer to create a similar work is a very efficient way for a production company to minimize risk. Also, for people on the project's production team who do not have a music background or any sort of musical vocabulary, using reference works allows for quick communication of a set of desired characteristics (which might be difficult for such people to express in words).

In supplying us with a reference track, our project supervisor has asked us to create a piece of music in a particular musical genre, with some specific structural requirements. By no means have we been asked to *copy* the reference work. We've just been given a set of rules within which to be creative. Now is an excellent time to test how well we've learned to objectively listen to music.

For the supplied reference track, we can apply the same techniques of sensitive listening that we've been using to widen our own personal music appreciation. There is no reason for us to fear that we will be unduly influenced by a reference track after we have made the effort to fully understand it. After such careful examination, creative possibilities may begin to suggest themselves spontaneously. These might include variations on instrumental techniques and alternate structural choices that preserve the visceral impact of the style while allowing us enough room for personal expression. In fact, our biggest obstacle in this task may be our own frustration about the necessity of consulting a reference work. Once we set the emotions aside, the entire experience can be a very positive one, resulting in personal growth as a composer. The reference track can teach us in a gentle rather than authoritarian way. We can consider it to be our own personal guru of musical style.

One further word about reference tracks: sometimes more is better than less. When supplied with a single reference track that has a very definitive feel, we can give ourselves more creative freedom by seeking out additional reference tracks, separate and apart from the one that our project supervisor provided. In striking out on our own to seek out additional references, we should concentrate on tracks that share some common traits with the one provided by the game company. This can serve to help us see the musical style within a broader context, as a genre rather than a single work. When we first receive that initial reference track from the developer, after listening to it sensitively and objectively, we can ask ourselves questions such as, "does this remind me of anything else I've

heard?" and "does this fit into a style category for which there are any accepted standards regarding form and structure?" After answering these questions, we can then seek out other tracks, apart from the one we were provided, in the hopes that these additional pieces of music might make it easier for us to be original while still supplying a track that meets the needs of the project.

Musicianship

Most of us were musicians before deciding to write music for a living. Early on, the allure of music led us to learn at least one instrument when we were kids, before the idea of creating music had taken hold of our imaginations. For a lot of us, that first instrument was the piano.

The piano, by its nature, is tremendously useful to composers during the creative process. The wide range of the instrument, coupled with the ability to play independent melodic lines simultaneously, makes the piano a terrific tool for experimenting with musical ideas that might subsequently be arranged for groups of instruments. In his self-titled autobiography, composer Igor Stravinsky described how as a child he preferred to improvise on the piano rather than practice his lessons. Later in life, Stravinsky asked his teacher, the composer Nikolai Rimsky-Korsakov, if he was right to always compose on the piano. Rimsky-Korsakov replied, "Some compose at the piano, and some without a piano. As for you, you will compose at the piano" (Stravinsky 1936, 5). Over time, a great many composers have followed this example, which may be the reason why the electronic keyboard has been so strongly favored in the field of music composition for visual media.

Lucky pianists! All of the tools and technologies that are made for composers also cater primarily to a pianist's skill set. Most music software is designed to facilitate the performance methods of keyboardists. While it is possible to work with these technologies without an ability to play the keyboard, it's also much more difficult. If we want to take full advantage of all that these software packages have to offer, we'll eventually have to learn to play the keyboard.

The good news is that those of us who are not primarily pianists do not need to develop virtuoso skills in order to take advantage of all the tools available. A basic capability will do just fine. Most of the software applications provide plenty of ways for keyboard-challenged musicians to get the job done, as long as we are willing (however awkwardly) to tickle those ivories.

Those of us who developed our primary musical proficiency on instruments other than the piano face both distinct benefits and persistent drawbacks. For instance, guitar players have a very commercial and marketable skill. In all the musical genres that benefit most from a guitar-driven sound, the guitarist composer possesses a clear advantage. While guitarists had previously been at a disadvantage when it came to working with digital audio workstation software, over the past few years some guitar *controller* instruments have been released that allow guitarists to participate in the benefits previously only available through keyboards. That being said, these instruments still present some significant performance weaknesses when used this way, so it's best for us to maintain our keyboard skills until the instrument manufacturers perfect the technology.

The same can also be said for many other controller instruments, which include models that emulate the playing methods of strings, woodwinds, and brass. These devices have the capability to be used as primary controllers for music software. However, as with guitar controllers, the limitations of wind, brass, and string controllers are significant. In my mind, these drawbacks pale enormously in comparison to the gigantic benefits of being able to record live string, brass, or woodwind tracks into a composition at the drop of a hat.

Composers for visual media tend to be one-stop shops. With the exception of large, big-budget projects known in the video game industry as triple-A, most of our gigs will not afford us the budget to hire outside musicians. Our personal musicianship therefore becomes a very important skill for us to nurture and improve. In fact, it is highly beneficial to pursue a proficiency in both a primary and a secondary instrument. Adding just one additional live instrument to our recordings can add a world of depth and feeling to a track. In my own case, my primary instrument is piano, and my secondary instrument is voice. I am a classically trained vocalist. I use this secondary instrument in many ways, both for atmospheric solos and for bombastic choir arrangements in which I overdub my own voice many times to achieve the desired *symphonic choir* effect. I have heard of other composers who overdub themselves in a similar manner. One composer overdubs his own violin performances until he achieves the expansive quality of an orchestral section. Other composers overdub their performances on various guitars to simulate the effect of a rock band. This type of live instrument overdubbing is a powerful tool for composers, and a

strong reason why we should remain committed to the integrity of our musicianship as a vital key to our success.

Music Theory

An understanding of music theory has the potential to help us access our creativity by providing us with a mental discipline tailored to fit our profession. Usually, the study of music theory entails an understanding of music notation, the types of scales and chord voicings, and the concepts of melody and harmony, non-melodic ornaments, chromaticism, and other such topics that illuminate both our academic and practical comprehension of musical sound. The study of music theory can be beneficial to composers working in any field, from those of us creating works for live performance, to those who have chosen to compose music for visual media (such as television and film). However, as game composers, we can use our understanding of music theory for very specialized tasks that are unique to our discipline.

There are certain concepts within the field of music theory that have particular significance to us as game composers. I will assume that we have all encountered these concepts before, and I'll be describing their application to the field of video games more thoroughly in chapter 10 (Linear Music in Games), chapter 11 (Interactive Music in Games: Rendered Music), and chapter 12 (Interactive Music in Games: Music Data), but I'll explain them briefly here.

Theme and variation is a key concept for us to fully understand. Like our film and television counterparts, we as video game composers will sometimes create melodies to signify important characters, special events, or particular locations. These melodic themes may then recur within the score, sometimes in an altered form called a variation. This practice does not particularly distinguish our work from that of composers for film and television. However, in video games we often use theme and variation to convey messages to the gamer. Certain musical themes may be used to inform the player that they are achieving successful results, or that they have arrived at a desired destination. Another distinguishing factor of the use of theme and variation in games can be found in its use within loops, enhancing the sensation of musical diversity within a track and easing the sense of repetitiousness when the track repeats (more on this in chapter 10).

Other concepts in music theory can often have unique implications in the field of video game music. For instance, in some games (particularly in the racing genre) the tempo of a particular piece of music is given over to the game itself, which will then have the liberty to slow it down or accelerate it depending on the player's progress. This unpredictability of the tempo poses challenges for the composer, who must then try to anticipate what the effect of those alterations will be. Understanding how tempo influences the listener and how it fits into the overall study of music theory can potentially help a composer grapple with these problems.

Counterpoint can be applied in unique ways within the structure of video games, particularly when used inside an interactive music system that we'll be calling *vertical layering*. In these circumstances, the individual voices of a counterpoint passage can be detached from each other and presented separately during gameplay, then recombined by the game according to the fulfillment of certain in-game criteria. It becomes important to perceive the counterpoint voices not only as they relate to each other but also in terms of their strength as stand-alone entities. We'll be discussing this concept in greater detail in chapter 11.

The study of music theory is constantly evolving. As new discoveries are added to the overall body of knowledge, these can offer game composers new options for addressing problems in game music composition. For instance, the video game *Super Mario 64* used a very effective musical illusion known as the *Shepard Scale*. This effect is the musical equivalent of the M. C. Escher painting of the endlessly ascending staircase. Like those infinite stairs, the notes of the Shepard Scale seem to ascend forever, yet they also never seem to get much higher than when they started. This is achieved by the overlapping of octaves moving in parallel, each line fading in and out to create a seamless illusion of infinite movement. *Super Mario 64* used this effect while the game's eponymous hero ran up an endless staircase, creating a powerful sense of both ascension and fixity. No matter how high Mario climbed, he would never reach the top.

This was a very specific and literal application of the Shepard Scale within a video game framework, but the technique could also be applied in a general sense. Using an ascending Shepard Scale can create a sensation of escalating dramatic tension that never ceases, which is useful for a track that may be looped repeatedly during a climactic moment. Likewise, a descending Shepard Scale may create a sense of an infinite falling motion that can be quite distressing. Because the actual length of these moments may be at the mercy of the gamer, a game

composer may find the Shepard Scale to be an appealing option.

Contemporary music theory includes some other concepts that arise from more recent experimentation. *Aleatoric music,* or music in which some elements are left to chance, has had a fairly dramatic influence on the field of video game composition. In this form of music, the performers are allowed the freedom to arrange musical phrases in any sequence they wish, or improvise freely during predetermined passages. Sometimes this improvisation results in large waves of sound—clusters that rise and fall with disturbing effects. Used most recently in horror games, this type of composition can be effective in setting an appropriately unsettling mood. However, this approach has also been used in television and film, and is thus hardly unique.

Finding a new use for this technique, video game developers have applied the aleatoric composition model toward the creation of *generative music.* To offer a simplified definition of this concept, in generative music a video game itself may assume the role of the musical performer and trigger predetermined musical phrases in unpredictable ways, often dictated by the state of gameplay. The resulting musical construct can be considered aleatoric because the element of chance was built into the composition as a fundamental principle of its design. This technique will be explored in greater detail in chapter 12.

An overall familiarity with music theory can also be helpful when developing a high-level music strategy for a video game project. In this case, the knowledge may assist both the composer and the member of the game development team directly in charge of music oversight for the project. The music design document for the project should give full consideration to whether linear or interactive approaches would best complement gameplay, and what musical techniques would work best (either from within a pure interactive model or in a matrix of linear components). Without a grasp of the core concepts of music theory, the author of such a document runs the risk of creating an impractical music strategy for the project.

Obtaining a good comfort level with the study of music theory can be very helpful to us as game composers, both in our initial planning stages and in our day-to-day working lives. That being said, we might also consider that it is possible to become *too* enthusiastic about the study of music theory. We might take into consideration the viewpoint of the renowned impressionist composer Claude Debussy, who admonishes us with these words: "There is no theory. You have only to listen. Pleasure is the law. I love music passionately. And because I love it, I try to free it from barren traditions that stifle it. . . . It must never be shut in and become an academic art" (quoted in Shapiro 1981, 268).

Video game development is still a very young, experimental field. The technical and artistic branches of the game development community constantly reinvent themselves through the creation of new tools and techniques. When innovative games become powerful success stories, the game industry is pushed to emulate this success by expanding its ambitions and increasing its knowledge. The practitioners in the artistic and technical divisions of the industry constantly evaluate their own skills compared to the changes occurring around them. This perpetual flux and change in the industry has become an evolutionary archetype, a *learn-or-perish* philosophy. As game composers, we are an integral part of this community, subject to the same forces that act upon the whole. Yet the learn-or-perish impetus can pose problems that force us to ask ourselves some profound questions. Should we allow the fluid, interactive nature of the video game medium to prompt us to move away from the dictates of music theory? When the rules of music are contrary to the needs of the game, should we feel free to break them? Our chosen profession may dictate that a compromise be reached between these two opposing forces. We may need to both accept the guidance of music theory and simultaneously break away to experiment, perhaps creating new models to add to the established principles of music academia.

Composition Experience

In this chapter we've discussed the skills that are important to us as game composers, and the many ways in which we can cultivate these valuable personal assets. The discussion has ranged from the benefits of a musical education (whether formal or informal), to the importance of competence in a primary (and secondary) instrument, to an ability to listen to music sensitively and learn from the experience, to the benefits of a foundation in music theory. However, none of these experiences provides as many opportunities to gain precious skills as actual composition experience. For the aspiring game composer, gaining composition experience can be a grueling uphill climb. Everyone's journey is different, so the only way I can really illustrate this point is by telling you about my own initial experiences as a game industry professional.

I didn't begin my career as a game composer. I spent over ten years creating music for *Radio Tales*, a drama series on National Public Radio. When I had my eureka moment playing the original *Tomb Raider*, I had no idea how I would turn a vague ambition to create music for games into an actual profession. Switching gears at that point in my career was a very scary prospect. In the beginning I flailed about, struggling to find opportunities to gain experience in my newly chosen field.

My first job in the video game industry was for a small start-up development company creating a futuristic fighting game with lots of robot warriors. Their project required me to compose five techno-inspired pieces of music. I knew almost nothing about composing music for games, which made the entire experience rather harrowing as I hurriedly sought out an education while simultaneously meeting the deadlines of the project. The developers had strong ideas concerning what they wanted the music to sound like, and the revision process for this first game taught me a lot about the rigors of the collaborative process. Numerous phone calls, e-mails, and multiple music submissions later, the development team finally signed off on my contribution to their game, and I got my very first paycheck in the game industry. I was tremendously excited! Unfortunately, as is too often the case in the realm of independent game development, the game itself was never released. I came away from the project with valuable on-the-job experience and a sensation of pride in having officially become a working game composer. However, I still had no *actual* professional credits.

My next attempt to get ahead in the industry seemed more successful, at least at first. I managed to be hired as the composer for a proposed massively multiplayer online role-playing game (MMORPG). At the time, the game had no publisher, although the fledgling team had high hopes of securing one. They hired me to create music for their project. Reading their impressively detailed design document for the game, I could hardly contain my excitement. Their proposed MMORPG was brimming with epic scope and idealistic ambition. This was my dream job, and I could not be more enthusiastic about it.

I experimented with a technique of overdubbing my own voice into a full choir. I hired a translator to convert my English lyrics into Latin, and I worked hard to perfect my new choral technique, resulting in a series of patriotic anthems for each of the game's factions. I also scored a presentation video that the team would use during the Game Developer's Conference that year. Hopes were high, but then reality came crashing down. Publisher interest failed to manifest itself, and the video game project eventually disbanded. As I write this, the game has evolved into a pen-and-paper role-playing adventure released in book form. Obviously, such a project has no music, so my collection of earnest compositions now sits in one of my hard drives, reminding me that we all must pay our dues.

By this time, I was getting a little discouraged. However, I'd heard about a new option that might advance my career, while also giving me the opportunity to learn and grow as a game composer. At that time, *mods* were tremendously popular. A mod is a modification of an existing retail game. In such a project, a mod team alters the original retail game by using the development tools that the game makers voluntarily release to the public. Many eager mod teams were developing games using the engines of numerous retail releases. I'd heard that these mod teams might need the help of a composer, and that some of these mods might go on to be sponsored by the original game maker and released at retail. *Red Orchestra: Combined Arms* from Tripwire Interactive was the most renowned success story. The mod had obtained both huge popularity and the support of the original game developer, Epic Games. The mod team's next game received a commercial release via online publisher Valve, which distributed the game through their download service, *Steam*.

I'd read about these stories, and heard of one particular in-development mod that was getting some unusual press coverage, primarily because of its technical sophistication. Taking a gamble, I contacted the team and asked if they would hire me to compose music for them. They were eager to take me aboard. I wrote a collection of tracks for their project, and then I waited for more of the game to be developed so that I could contribute more. That wait proved to be very long. As is too often the case, the development of the game slowed to a crawl and then ceased as the team members lost interest.

This was my third unreleased game in a row, and might have been demoralizing enough for me to rethink my enthusiasm for game music composition. Thankfully, my *real* break into the industry would happen about a month later. This job would become a huge turning point, and the success of the game would also serve as a marvelous platform for my future career. I'll talk about that experience in chapter 14.

While these early efforts did nothing to build my professional credits, they did provide me with tremendous opportunities to learn, for which I am very grateful. Nothing can take the place of actual composition experience. As disheartening as it can sometimes be to work on a project that is never completed, the chance to learn on the job is worth the emotional price. Once we're able to roll up our sleeves and put our abstract knowledge to concrete use,

we are able to learn lessons that we can never obtain from a book or an instructor. Practical experiences such as these teach us as much about ourselves as about the profession we have decided to pursue.

So now that we have explored the skills and resources that we can use to help us better access our creativity and maximize the quality of our compositions, let's turn toward the actual process of music composition for games, beginning with the concept of *immersion*.

3

Immersion: How Music Deepens the Play Experience

A few years ago, a small independent studio released an unusual horror game that provoked a lot of attention. The game itself didn't introduce any radically unique gameplay mechanics, nor did it break any new ground in terms of presentation or technology. What this game did outstandingly well was scare the living daylights out of people.

Shortly following the game's release, an assortment of gameplay captures made their way to video hosting sites. Gameplay videos on the Internet have become commonplace, serving as one of the chief vehicles through which gamers help each other solve difficult puzzles or defeat powerful enemies. These videos typically include a voice commentary, enabling the person making the video to offer advice or humorous observations. At least, that is *usually* the gist of these voice tracks. For this particular horror game, however, the vocal tracks on the gameplay videos were very different. When I first saw a few of these videos, I was astonished. I'd never heard gameplay accompanied by so much flat-out *screaming*, coupled with whimpering, obscenity-charged exclamations, and other forms of sheer panic. Some of these gamers were even begging for divine intervention as their virtual avatars cowered in the darkness while a vaguely perceived monstrosity lurked nearby.

What had happened to these hard-core gamers, veterans of countless other virtual adventures? Didn't they know that they were sitting in front of a screen, holding the shift key to navigate quickly through a simulated environment, not running blindly through a dank stone corridor dripping with slime? Why were they pleading for their lives?

The game was entitled *Amnesia: The Dark Descent* (Frictional Games), and offered a perfect demonstration of the *immersion* phenomenon in full effect. When it works, immersion is incredibly powerful. It's an important concept for us as game composers to understand, because it forms such a central part of our work. While the concept is not unique to game design, it functions in very specific ways within the context of gameplay. Only by understanding the phenomenon of immersion will we be able to successfully enhance the effect through our musical compositions.

Suspension of Disbelief

Let's start by exploring a related concept from the world of literature, known as the *suspension of disbelief*.

The importance of believability is a concept found in the earliest surviving work of literary theory. In the *Poetics*, the philosopher Aristotle writes: "The poet should always aim either at the necessary or the probable. Thus a person of a given character should speak or act in a given way, by the rule either of necessity or of probability; just as this event should follow that by necessary or probable sequence" (335 BCE, XV).

If believable, probable action is such a fundamental principle of literature, how does the artist reach beyond the confines of the natural world to tell a more fantastical story? Suspension of disbelief makes this possible. We can thank the celebrated poet Samuel Taylor Coleridge for both coining the succinct phrase and beautifully summing up the concept. In describing his method for including supernatural, otherworldly stories in his poetry, Coleridge (1817, Chapter XIV) writes, "my endeavours should be directed to persons and characters supernatural, or at least romantic; yet so as to transfer from our inward nature a human interest and a semblance of truth sufficient to procure for these shadows of imagination that willing suspension of disbelief for the moment, which constitutes poetic faith."

So, according to this definition, the suspension of disbelief is an activity that we willingly embrace. We do this in order to appreciate imaginative literature. Much like a contract, we agree to accept the more outlandish aspects of a story we might otherwise reject as straining the bounds of credulity. In return, the author agrees to promote our suspension of disbelief through the strength of the narrative. Using all the tools and techniques of great literature,

the author strives to create a sense that the events of the plot are both "necessary and probable," thus instilling a semblance of realism at the heart of the tale. This realism is constantly reinforced, whether through the actions of believable characters with genuine emotions, or via the small details of the environment, impressing the reader with a sense of the world's authenticity.

If we can interpret Coleridge's allusion to "human interest" as an appeal to the emotions of his readers, then Aristotle may address the same concept in describing the structure of the tragedy. He asserts that the tragic drama should elicit "pity and fear effecting the proper purgation of these emotions" (335 BCE, VI). Connecting the action of the story with an emotional upheaval in the audience, Aristotle introduces a very human factor into the equation. If we consider Coleridge's allusion to "human interest" as an echo of Aristotle's emphasis on emotion, it suggests the importance of not only *believing* in the story on an intellectual level, but also *empathizing* with the truth of the tale.

With this in mind, let's consider the idea that belief exists on two separate levels, as a rational viewpoint and a subjectively emotional one. Combining these two viewpoints imbues the suspension of disbelief concept with an emotional urgency. This idea will become more important as we further explore the concept of immersion, connecting these theories to our work as game composers.

Immersion

The "suspension of disbelief" idea is a very helpful place to start when thinking about immersion and the part it plays in video game design. But the terms "immersion" and "suspension of disbelief" are hardly interchangeable. To define immersion in its most literal sense is to talk about being dunked in water until we are completely below the surface, lost in that muffled world, with little bubbles rising all around us. Beyond the literal definition is the more abstract metaphor, which has a subtle but pervasive power. The concept of sinking completely within something, or being absolutely surrounded by it, is the core principle of immersion. When watching a film, immersion takes place when the viewers forget that they are sitting in a movie theater and are instead mentally swept into the experience, leaving their popcorn far behind. When reading a book, immersion takes the form of a vivid mental journey that erases the presence of the book in the reader's hands, as though the experience were somehow being psychically transmitted.

In a video game, immersion takes place when the gamer loses consciousness of the methods of perception and interaction in the game. That sweaty game controller is no longer mentally registering; the button combinations are so thoroughly sublimated as to occur automatically, like breathing and blinking. No longer is the video screen asserting its presence as the visual communicator; no longer are the speakers or headphones acknowledged as the source of sound. The gamer has stepped through Alice's looking glass, and is now wandering free through Wonderland.

Immersion in video games differs from immersion in other forms of entertainment in that it is not a passive experience, but rather an active one. In research studies examining the unique principles governing immersion in video games, the theory of *flow* is often discussed. As coined by prominent psychology researcher Mihaly Csikszentmihalyi, flow is a state in which "people become so involved in what they are doing that the activity becomes spontaneous, almost automatic; they stop being aware of themselves as separate from the actions they are performing" (1990, 53). According to Csikszentmihalyi, flow is a highly desirable state because while in that state we completely lose our sense of self-awareness—"And being able to forget temporarily who we are seems to be very enjoyable" (64).

Video games have the potential to offer a particularly involving and powerful kind of immersion. But how is immersion attained, and how can we as game composers contribute to it?

Immersion and Suspension of Disbelief

In an article for the journal *Science,* Harvard professor and researcher Chris Dede (2009) draws an interesting connection between the concepts of immersion and suspension of disbelief, implying in his article a direct cause-and-effect relationship. "The more a virtual immersive experience is based on design strategies that combine actional, symbolic, and sensory factors, the greater the participant's suspension of disbelief that s/he is 'inside' a

digitally enhanced setting" (66). According to Dede, an immersive experience requires the participant to receive compelling sensory information about the simulated environment, take action and cause reactions within that space, and experience deep emotions triggered by archetypal symbolic content encountered inside the virtual world. With these influences in place, players are empowered to suspend their disbelief, which in turn enables the full immersion effect. Without a belief in the truth of the experience, the player may never become immersed in it. Therefore, immersion depends on the suspension of disbelief and vice versa—without one, the other can't take place.

Writer and game designer Allen Varney (2006) describes immersion as "intense focus, loss of self, distorted time sense, effortless action." All of these sensations, when combined, lead to that magical state we call immersion. It is the holy grail of game design. When fully immersed, a gamer can play for hours on end without any awareness of the passage of time. When at last emerging from an extended play session, a gamer may feel both exhausted and euphoric. The urge to return to that game may then be subsequently enhanced by the memory of the pleasurable immersion and hypnotic flow that the gamer experienced while playing it. At its best, there is no other sensation quite like it within the realm of human experience.

So now that we understand what immersion is, how do we apply this idea to our work as game composers?

Music and the Three Levels of Immersion: Engagement

In 2004, Dr. Paul Cairns and Emily Brown presented a paper at the ACM SIGCHI Conference on Human Factors in Computing Systems entitled "A Grounded Investigation of Game Immersion," which included discussion of something the authors call "The Three Levels of Immersion" (1298). The ideas in that paper are helpful to us now as we contemplate how game music can enhance immersion. We can use the three levels of immersion as both a guide and a structure on which to discuss our musical approach to the topic. Also, the construct as described by Cairns and Brown is somewhat reminiscent of "leveling up" in a video game, so the gamers among us should feel right at home.

Figure 3.1

28
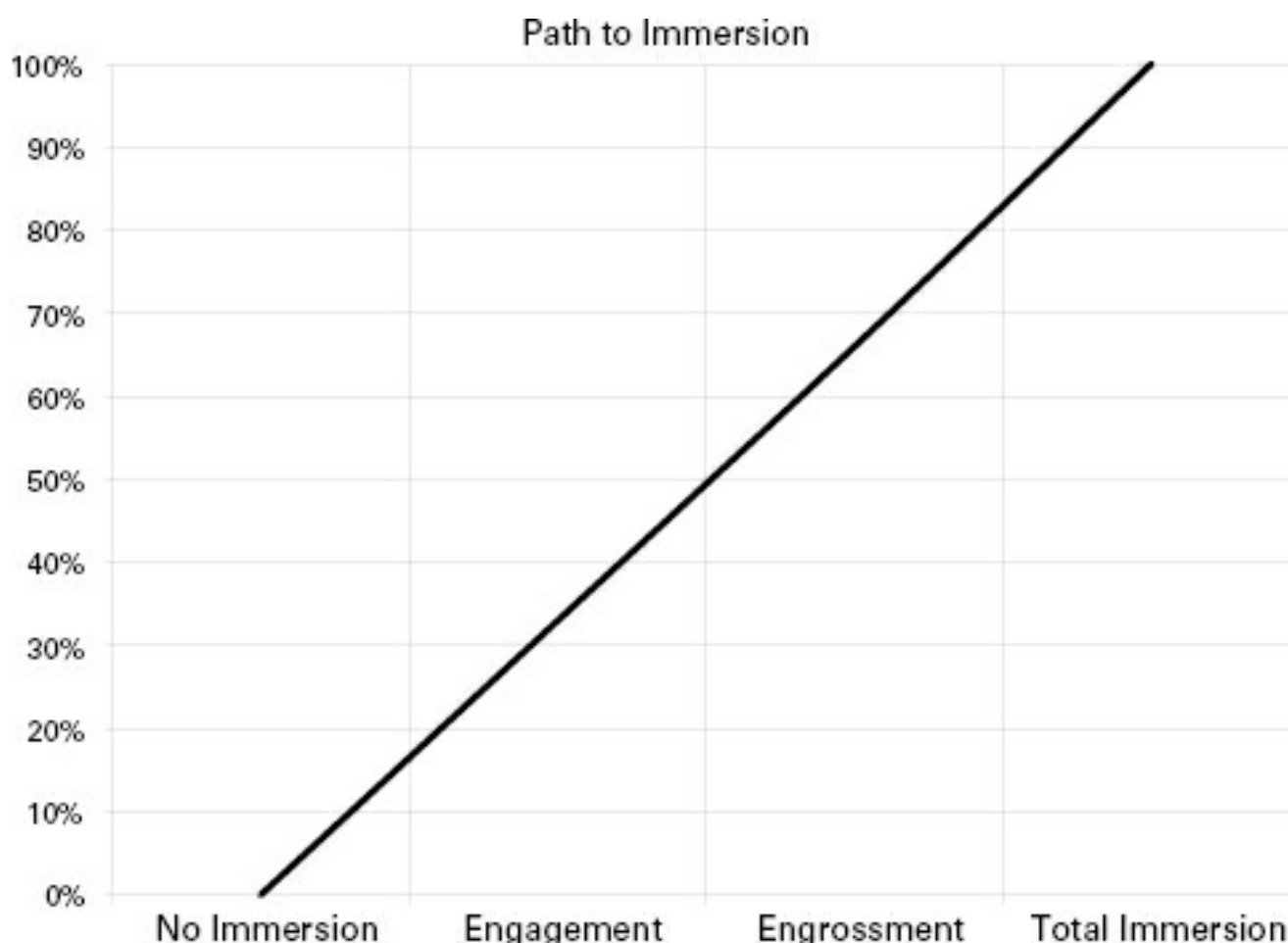
The path to immersion, according to Cairns and Brown. Moving from a state of no immersion to total immersion is dependent on passage through three distinct stages.

The first level of immersion is *engagement,* which Cairns and Brown describe as the player's willingness to invest time, effort, and attention to the game. Without this basic motivation, immersion can't be attained. Modern video games can be time consuming and labor intensive, requiring the player to memorize a set of fixed rules and develop skills ranging from manual dexterity to strategic problem solving. For something that is supposed to be fun, video games can sometimes feel like work, especially to the newcomer. Nevertheless, engagement must be attained before we can advance to the next level of immersion. The entire development team will do everything they can to make the game accessible, from carefully designing the control scheme, to broadening the demographic appeal of the core concept, to meticulously scaling the difficulty in order to please both hardcore and beginner players. As game composers, there are many ways we can help.

The Path to Engagement: Initial Emotional Reassurance

At the very beginning of any video game, a new player is presented with a host of options. These will vary by the type of game. For those games that allow a player to create a customized avatar, the choices may include gender, race, class, economic background, politics, talents, vices, height, weight, features, wardrobe, weapons, tools, vehicles, etc. Beyond this, a player may choose the difficulty level of the game, the layout of the controller, how the visuals will be displayed, the volume of audio and music, whether the game will be single player, offline cooperative play, online co-op, online multiplayer, etc. In addition, the player may be confronted with a smorgasbord of tutorial options, demonstrating a spectrum of skills that must be learned in order to play.

Considering all these choices, a player may be initially overwhelmed or even discouraged by the apparent complexity of the game. This can pose a very large barrier to access. As game composers, our job here is to offer emotional reassurance to the player. While this shouldn't necessitate overtly soothing music at the beginning of a game, we should be aware that a rousing anthem or a pounding action track may only serve to increase player anxiety. We may need to resist our instinct as game composers to create an impressive initial statement of the game's musical identity. We certainly want to communicate to the player that the game will be exciting and fun, but considering that some players may be feeling a bit dazed, we don't want to scare them any further.

This musical approach can be used throughout the game when the player is presented with new choices or is required to learn new skills. It is always a good idea to avoid enhancing the frustration or anxiety level of the player. To augment the player's sense of engagement, we should carefully assess the energy level of our music in those moments when the player may be confused or upset. This is a consideration that should guide us, as well as our supervisors on the development team.

The Path to Engagement: Navigational Assistance

Sometimes, the goals in a game can become unclear, or the passage of time can serve to dull the memory of these goals. When this happens, players may feel stranded, directionless, and adrift; they may stop and ask themselves where they are supposed to go in order to complete a quest or destroy a target. These bewildered pauses have great potential to disrupt the player's engagement with the game. Developers have tried many methods to avert these moments of confusion, with strategies ranging from understated text boxes on the screen to overtly glowing paths of light that lead to the next gameplay destination. Music can provide two of the most subtle and effective methods of nudging players in the right direction.

The first method is the *absence* of music. A player will notice when the music that previously characterized a particular location gently fades away, leaving behind a relative silence that creates the impression that there is nothing more to see or do. In creating a sense of *nothingness* through the removal of the musical score in a specific locale, the game developers hope that the player will be subconsciously prompted to go elsewhere. This is a time-honored technique that has been employed across many game genres, from old-school adventure games to modern shooters. While it is not a particularly sophisticated approach, it can be very effective. When withdrawing the musical score for this purpose, we should try to be as subtle and artful as possible, so that the player registers the change on a subconscious level. When handled correctly, the player should only feel a sense of vague dissatisfaction with the game's "emptiness" in that area, leading to a desire to explore other places.

Another way in which music can nudge players in the right direction is through the concept of musical *hinting*. When a player enters a new region within the game, the musical score can suddenly introduce an attention-grabbing motif when a critical part of that environment draws into view, letting the player know that this area is important and

should be explored. As another time-honored technique in game development, this musical strategy can benefit from many of the more sophisticated modern procedures of game music integration, allowing these musical hints to emerge in a more natural way from the existing score (we'll be talking more about these methods in chapters 11 and 12).

The Path to Engagement: Gameplay Identification

Confusion and frustration combine to form large obstacles in the path toward complete immersion, and yet game designers are also keenly aware of the need to make their games stimulating, full of fresh and intriguing new challenges that keep the experience engaging over time. Keeping these two opposing goals balanced is a continuous struggle for developers, but we as game composers can help bridge the gap.

Csikszentmihalyi's concept of flow depends on a loss of personal awareness and a sensation of spontaneous activity independent of conscious direction. If we apply this theory to the concept of game immersion, then in order for the activity of gameplay to become immersive, the actual procedures must reach the state of an automatic response, similar to a reflex action. This state is threatened the instant that the player feels the need to pause and ask, "What am I supposed to be doing now?" As composers, we can send powerful messages to the player about what gameplay activity they are expected to perform at any given time.

Let's start with a very simple example. Traditionally, game music does a good job of identifying two opposing gameplay states: combat and exploration. These two states may involve a host of controller inputs unique to each state. Button combinations for combat maneuvers may be unavailable at other times, and some menu and control options during exploration may become unavailable during combat. If there is any ambiguity between these two states, the player may suddenly wonder what button combinations and menu options are currently available. Thinking about buttons and menus is a very effective way to lose a sense of immersion.

In this situation, music can help to quickly identify the current state of gameplay. For example, a player may be attempting to stealthily avoid a confrontation with a group of nearby enemies. Suddenly, the enemies spot the intruder, and the musical score kicks into an anxious, high-energy mode. Even if the player hadn't yet noticed the change of circumstances, the music can be relied on to quickly announce that stealth has failed and the time has come to fight. Likewise, the change from high-energy combat music to a more relaxed musical texture can let the player know that all enemies have been defeated and it is now safe to explore.

Broadening out from this simple example, we can find many in-game situations in which music may help to identify the type of gameplay required. Special music styles can be triggered during a plethora of gameplay types, including timed challenges, platforming segments, puzzle-solving, dialogue interactions, context-specific minigames, statistics adjustments when leveling up characters, etc. There are many possible uses for this technique, and nearly all games make use of it in some capacity, if not extensively. While the game itself works hard to provide the player with all the information needed to mentally adjust from one gameplay type to another, music can be tremendously helpful in achieving that goal.

The Path to Engagement: Time Perception

According to Cairns and Brown, the player's willingness to invest time in a game is a crucial factor in achieving engagement, the first of the three levels of immersion. Any video game will require a minimum investment of time in order to be enjoyable, but that minimum amount of time can vary by a wide margin, depending on the game's design. Some games specifically target people who are only casually interested in gaming, and purposefully limit the amount of time that would be required in order to successfully play. For these games, there is less risk for the player who chooses to invest time in the game, since ten or fifteen minutes can hardly be considered a large investment. The developers, likewise, do not need to worry about keeping a player interested during protracted play, since this is not the way they designed their game to be played.

But what about those games designed to be played for hundreds of hours? This is an enormous commitment for the player. If time can be equated with money, then players of games like these may sometimes feel like very big spenders. Moreover, they may occasionally feel as though they are spending their valuable "time" currency on something that our culture has repeatedly called trivial, antisocial, and even wasteful. All of this has the potential to make players feel self-conscious, and immersion depends on a loss of personal awareness in favor of the world of the game and the activities within it. Self-consciousness is an enormous problem in the quest for immersion.

So, how can we as composers influence the player's perception of the passage of time? The design team will be doing everything in its power to strategically pace the events of the game in order to keep the player engaged, but

we as composers have a distinct advantage: our discipline is entirely based on time. In fact, music is a sonic expression of time. As composers, we have the unique ability to influence the player's perception of how quickly (or slowly) time is passing.

Research into the effects of music on time perception has yielded some fascinating results. Dr. James J. Kellaris of the University of Cincinnati has conducted numerous studies on the psychological effects of music, including its ability to alter our perception of time. According to an experiment conducted by Kellaris and Robert J. Kent of Drexel University, music in a major key has the capacity to cause the listener to perceive time as moving more slowly, whereas music in a minor key or music that is completely atonal results in the listener perceiving time moving at a more rapid pace (1992). Other studies have suggested that loud music can make time feel as though it is passing more slowly (Kellaris, Powell Mantel, and Altsech 1996), that music with a faster tempo may also make listeners feel as though they have spent more time listening to it than has actually occurred (Oakes 1999), and that music lacking complexity can make time feel slower while complex music can make time feel as if it is flying by, particularly if that complexity is displayed by the foreground melody (Kellaris, Krishnan, and Oakes 2007).

As game composers, it would be very limiting for us to take this research entirely to heart, letting empirical assertions supersede our own inspiration. However, we can certainly contemplate these fascinating study results and keep an open mind, particularly if we are faced with dilemmas involving the perception of time. For example, if the development team is struggling with a combat sequence that seems to last just a tad too long, would it help for the music to feature a complex and dynamic melody that may make time feel shorter? If an important section of story-propelling dialogue seems to end as quickly as it begins, perhaps a faster tempo may make the player feel as though the dialogue has lasted longer. If a puzzle-solving sequence seems a bit too long, maybe using music in a minor key will help it feel like a shorter, brisker experience.

Ultimately, we must use our own sense of aesthetics as our final judge when we are composing music, but isn't it nice to have a range of possibilities to consider when making these artistic choices? Music can have a very powerful influence on the listener, and this includes the listener's perception of and relationship with the passage of time. Stravinsky expressed this idea beautifully when he said, "The phenomenon of music is given to us with the sole purpose of establishing an order of things, including, and particularly, the coordination between *man* and *time*" (1936, 54).

Music and the Three Levels of Immersion: Engrossment

The second level of immersion, according to the research of Cairns and Brown (2004), is *engrossment,* which they define as a higher level of emotional investment and a corresponding decrease in self-awareness. These two outcomes are attributed to a combination of strong visuals, interesting tasks, and a compelling plot.

Keeping to our leveling up metaphor, let's assume that we have beaten the engagement level of this immersion game. With our music, we have helped the developers to overcome those obstacles that keep a player from giving the game the fullest attention possible. Now, as we move on to level two, let's look at the three prerequisites to engrossment—strong visuals, interesting tasks, and a compelling plot. In examining these three concepts, let's contemplate some ways in which our music can help the developers beat these challenges and achieve full player engrossment.

The Path to Engrossment: Strong Visuals

So, how can music help visuals appear to be stronger? Presumably, music reaches the ears, not the eyes. However, music affects the activity of the brain in ways that have a direct influence on how we visually perceive the world around us. Researchers have long known that music has the power to elicit changes in the emotions of listeners, altering moods and inducing emotional states ranging from happiness to fear. Recent studies have found that music can also have a direct effect on our ability to perceive and interpret visual stimulus. In a research study conducted in the Netherlands at the University of Groningen, subjects were asked to identify happy and sad faces that were inserted subtly in a noisy pattern, making them challenging to detect (Jolij and Meurs 2011). Music was used to alter the mood of the subjects while they performed the task. The study found that playing sad music resulted in the successful identification of sad faces as opposed to happy ones, while happy music would lead the test subjects to identify happy faces. The test subjects even thought they saw faces when there were no faces at all, and the nature of those imagined faces corresponded to the mood of the music that was playing.

Does this mean that music influences the details that we visually perceive? Would sad music in a gameplay sequence lead a player to notice the grim and somber aspects of the visual presentation, while failing to notice cheerier elements? Conversely, would happier music lead a player to notice small joyful details of the environment that would otherwise go unnoticed? If this is the case, then it becomes imperative that the visual artists, composer, and music team coordinate their efforts conscientiously. A bad audiovisual match could mean wasted effort on the part of artists who have created extraordinary visual works that players subsequently fail to perceive. An excellent audiovisual match, on the other hand, could draw the eyes of the player to the outstanding beauty and power of the art design, bolstering the perception of the visuals as a strong contribution to the overall experience.

Music can have a profound effect on the mood of the listener, and a change in mood can affect not only what is visually noticed, but also how much visual detail can be perceived. At the Affect and Cognition Laboratory at the University of Toronto, researchers conducted an experiment to determine how mood influences visual perception (Schmitz, De Rosa, and Anderson 2009). They showed study participants photographs of people displaying either positive or negative emotions. The study participants reported that these photographs had caused them to feel a similar positive or negative emotion. The display of these initial photographs was then followed by composite images of various houses and locations assembled in a collage. Using functional magnetic resonance imaging, the researchers monitored the subjects' visual cortical activity. Those study participants who were first shown faces with positive emotions also showed much greater visual cortical processing of the composite images that followed. The researchers concluded that a positive mood increases a person's field of view, allowing them a wider range of vision than those experiencing a negative mood, whose field of view would be comparably narrower.

The results of this study have complex implications for the use of music within the video game framework. Often, game developers will want a composer to create sad music to enhance the atmosphere of a grim environment or to intensify the tragic implications of a story development. If sadness really has the power to narrow a player's field of vision, then this could possibly focus the player's attention solely on their own avatar and a limited surrounding sphere, ignoring the rest of the environment on which the artists have poured so much labor and passion. On the other hand, sad music could have the power to help direct the player's attention to singular events or objects to the exclusion of all else that may be happening onscreen. Conversely, happy music may have the power to expand the player's field of vision to encompass more of the full picture, allowing for a greater awareness of the entire visual presentation and all activity occurring in the environment.

Whatever musical strategy is employed, music will certainly have an effect on how a player visually perceives a game. Our goal as composers will be to create music that matches the emotion of the visual aesthetic, so that the player will be able to perceive the beauty and detail of the graphics and animations. Should we also consider that our invocation of sadness might narrow the visual focus of our listeners? This is a more complicated question. Perhaps this sadness might serve to enhance the experience of fighting the final boss at the end of a long game, when it is best for the player's attention to be focused to a laser point. A thread of tragedy, and a possible narrowing of visual focus, might together make such a final confrontation feel even more intense. At any rate, we will have to consider this issue on a case-by-case basis.

However we choose to interpret these findings, or however they influence the way we compose, it is important that everyone on the development team understands how profoundly music can affect the player's visual enjoyment of the game they are creating.

The Path to Engrossment: Interesting Tasks

The second of the three essential elements that contribute to an engrossing gameplay experience is the inclusion of interesting tasks. In order for a game to ultimately become immersive, it must provide activities that are intellectually engaging and enjoyable. As composers, let's now ask ourselves—is it possible for music to make a gameplay task seem more interesting and enjoyable? If so, how can we accomplish this? Here, again, science has provided plenty of research for us to think about.

First of all, let's consider the question of whether music can have any positive effect on the enjoyment of a task. In a 2005 research study conducted by Dr. Teresa Lesiuk of the University of Windsor, Canada, computer software developers at four different companies were studied over a five week period to determine if music listening exhibited any beneficial effect on either work performance or work enjoyment. The study found that listening to music exerted an appreciable increase in both the quality of work and the workers' enjoyment of their jobs. According to these findings, listening to music may help us enjoy our tasks more, and may also make us better at them.

Several studies have also reported that music can make us temporarily a little smarter. The reasoning behind this effect is that when listening to exciting music that we find enjoyable, our focus becomes sharper and our mood improves, leading to better intellectual performance. Music listening has been shown to improve performance on tests of cognitive ability (Schellenberg 2005), tests on spatial ability (Husain, Forde Thompson, and Schellenberg 2002), and even some standard IQ tests (Schellenberg et al. 2007). The effect wears off, but it is a well-tested and documented phenomenon. Two common factors remain important components of this effect. The music needs to be peppy and upbeat, and it has to be in a major key (what we might otherwise call "happy music"). While this phenomenon used to be called the *Mozart Effect,* recent research studies agree that this effect has more to do with how enjoyable and exciting the listener perceives the music to be and less with whether it is written by Mozart or not.

If music has the power to make a task more enjoyable and make the person performing that task more capable of achieving success, then only one question remains. Can music make a task more intrinsically interesting? This is a more difficult question to answer, but there are two intriguing studies on the subject. We know from an abundance of previous research that music has the power to induce a happier mood. A lighter mood has also been shown to increase both interest and positive evaluation of a task. In a study involving a group of physicians assigned to perform a routine diagnostic task, researchers induced a happy mood (via a gift bag of candy) in the test subjects while providing no sweets to the control group (Estrada, Isen, and Young 1994). The results showed that those study participants in the happier group reported that the assigned task was more intrinsically motivating. In a second research study into the effects of music on sport and exercise, researchers from Brunel University found that music helped athletes to achieve the attainment of Csikszentmihalyi's state of flow, which the researchers defined as "the zenith of intrinsic motivation" (Karageorghis and Priest 2008).

So, if we are to infer from this research that music has the power to make gameplay tasks more interesting, then we now have an important problem to consider. Many of the positive effects described above are dependent on peppy and cheerful musical styles, whereas the artistic style and atmosphere of many games would clash sharply with such a musical approach. But we may be well advised to remember that slow tempos and negative emotional effects may not always help a player feel interested in the tasks posed by the game's design. There are certainly times within a game's overall musical score in which a somber and ponderous style is the only possible choice for a composer, but most often, we composers have the liberty to brighten those dark moments with subtle traces of light. A hint of optimism, coupled with an undercurrent of energy and purposeful resolve, may serve to help enhance the player's interest and enjoyment, even in the bleakest moments of the game.

The Path to Engrossment: A Compelling Plot

One could argue that a game with no plot at all can nevertheless cause a player to reach Csikszentmihalyi's state of flow. For instance, a plot-free puzzle game, when well conceived and designed, has the potential to cause that loss of self-awareness and those automatic physical responses that typify the flow state. However, while the flow state shares similarities with the concept of immersion, the requirements for immersion as set forth in the research of Cairns and Brown are higher. The last component of solid game construction needed for the attainment of the engrossment state is a compelling plot.

At this point, we come full circle to the subject matter we were discussing at the very beginning of this chapter— the willing suspension of disbelief. Not only is this a fair literary proxy for the concept of immersion, it is also one of the core ideas at the center of a compelling plot. No story can have an impact upon its audience unless it is believable, or, as Aristotle would have phrased it, "necessary and probable." Mark Twain (1895) summed up this idea very well while writing an otherwise scathing article of literary criticism: "The personages of a tale shall confine themselves to possibilities and let miracles alone; or, if they venture a miracle, the author must so plausibly set it forth as to make it look possible and reasonable." So, according to Twain, if a plot is to be compelling, we must be able to believe in it, to put our faith in the writer's hands and set our skepticism aside for the duration of the experience. The writer, in return, must justify that faith by creating a world that is consistent and plausible, peopled by characters that behave in ways true to both their natures and to the human condition. How can the composer enhance the believability of a game's storyline and environment? Can music make a game feel more real?

While it is well understood that music has a profound effect on emotional states, research has also shown that music can have a dramatic effect on the understanding and appreciation of plot. In a research investigation conducted at the Universität Hildesheim in Germany, a short film was produced in which the actions of the characters and their motivations were purposefully ambiguous, with an open-ended culmination that suggested the film's story would progress beyond what had been seen (Bullerjahn and Güldenring 1994). The researchers hired

three professional composers to create several different underscores for the same short film. Working separately, each of the three composers created dramatically different original musical interpretations of the actions and emotions of the short film. The musical styles of the alternate scores ranged from the tension and mystery of a crime thriller to the heartwarming sentiments of a family melodrama. Study subjects were organized into groups, each of which was shown one of the various versions of the short film. The subjects then filled out a questionnaire in which they were asked to interpret the apparent plot and predict the subsequent actions of the characters beyond what the film had depicted. Not only did the nature of the music dramatically influence how the viewers interpreted the actions they saw onscreen, but the music also had a powerful effect on the predictions they made regarding the future actions the characters might take. Music was clearly acting beyond its typical role as an emotional enhancer, stepping into the role of a storytelling agent and shaping the audience's understanding of the plot.

In this controlled experiment, music could be singled out as an experimental factor among other elements that did not change, allowing the researchers to judge how music influences the interpretation and appreciation of story. In most real-world circumstances, it is difficult to judge what impact music has on an audience's understanding of plot given all of the other plot-oriented messages that are constantly being delivered in any story-driven work of theater, film, or interactive entertainment. A research study such as that conducted by Bullerjahn and Güldenring allows us to appreciate the strong messages that music can deliver to the audience, not only about emotion but about action, as well. Further, we can consider the words of noted researcher Claudia Gorbman, who strongly advocated this idea in an article for Yale University Press: "The moment we recognize to what degree film music shapes our perception of a narrative, we can no longer consider it incidental or 'innocent'" (1980, 183).

If we accept that music has the power to deliver storytelling messages, then our responsibilities as game composers must broaden to include the interpretation and enhancement of plot. This would involve an understanding of what makes a story compelling and enjoyable, and an ability to recognize the strongest aspects of a game's story so that we can attempt to heighten the player's appreciation of those elements. It is useful for a composer for any type of storytelling media (film, television, games) to study dramatic writing at some point. We don't need to become excellent writers but, by learning about the craft, we can better understand how the plot functions within the larger framework of the gameplay experience. Armed with this knowledge, we'll have a better chance of recognizing when a particular plot point needs to be musically highlighted or when a set of character actions needs clarification by way of some strategic musical emphasis.

As composers, we have many tools at our disposal for accomplishing these tasks. In dramatic works such as films, television programs, or video games, music can communicate on both the purely emotional level and on a more intellectual level governed by associated concepts. For instance, a particular musical instrument can be connected with a character when first introduced, with an important object or location, or with a recurrent plot element that is a central issue of the overall storyline. This musical instrument can then serve as a mnemonic device, reminding the player of that character, object, or plot element (even when such things are not present). This sort of mnemonic association can also be accomplished with short melodies or melody fragments, which are sometimes called *leitmotifs*. More detailed discussion of leitmotifs, and other types of musical themes, will follow in chapter 4.

Music can also enhance the player's suspension of disbelief, and thus strengthen the effectiveness of the storyline, by creating a musical atmosphere that reflects both cultural and environmental authenticity. This is where the concept of pure musical score (*non-diegetic* music) begins to take on some of the aspects of *source* music (*diegetic* music), which is perceived as music belonging inside the story itself. The traditional difference between source music and musical score is that source music is typically performed visibly. When hearing source music, we can either see the musicians playing their instruments or we can perceive the music to be emanating from a playback device that the characters of the story can also observe and possibly manipulate. This is in stark contrast with the musical score, which is not perceived by the characters and is performed invisibly. When composing a musical score that strives to convey a sense of cultural and environmental authenticity, we are adapting principles of source music into the body of the score.

Many video games take place in exotic or unfamiliar environments, ranging from real-world locations of the past to imaginary realms. As an example, we would assume that a game about organized crime taking place in 1920s Chicago might feature source music evoking ragtime and the jazz age, but there is no reason to limit this musical approach just to music that is performed onscreen. When the musical score reflects the strong permeation of ragtime and jazz in the culture of the 1920s, it also serves to make the environment and storyline feel more real. Likewise, a video game about a completely imaginary environment can benefit from a musical score that seems culturally influenced by the histories and peoples of its fictional world (more about this in chapter 6).

Music and the Three Levels of Immersion: Total Immersion

According to the research of Cairns and Brown, achieving engrossment and thus conquering the second level of immersion is dependent on attaining a higher level of emotional investment and a decrease in self-awareness, both of which are supported by effective game construction. We've explored the three aspects of strong game construction as described by Cairns and Brown, and discussed how music can work to enhance each aspect. By virtue of the power of positive theoretical thinking, let's assume that we have successfully assisted the game developers in achieving engrossment. On to the final level of this game—*total immersion*.

Just as in any other game, the final boss is always the most difficult. Total immersion is the ultimate goal of the journey, but it's a big step to take. To be totally immersed is to take that final step through the looking glass and transfer consciousness fully into the Wonderland that the developers have created. Cairns and Brown have defined two essential prerequisites to this phenomenon, so let's explore those two concepts and discuss how our work as game composers can assist the developers in achieving total immersion.

Prerequisite to Total Immersion #1: Attention

In the context of total immersion, Cairns and Brown (2004) define *attention* in a manner somewhat different from its traditional definition. We've already established that the player has agreed to commit time, effort, and attention to the game via engagement (the first level of immersion). The type of attention to which Cairns and Brown are now referring goes beyond passive observation and reaches a more concentrated focus. This elevated level of attention is heightened and encouraged by the game's inherent "atmosphere." Again, Cairns and Brown are not referring to the type of atmosphere that might be created by strong visuals (as in the engrossment stage). Their definition of atmosphere in this context takes on new urgency by requiring the player to pay strict attention to all visual and auditory information that the game transmits. The need to pay close attention to the various sensory indicators provided by the game is a crucial prerequisite to total immersion.

There is interesting research into the relationship between music and the attention of the listener. A study published in the *Journal of Music Therapy* found that exposure to music decreases distractibility and increases attention and memory capacity during cognitive tasks (Morton 1990). But perhaps an even more intriguing finding on this topic can be found in a Stanford University study conducted in 2007 and published in the magazine *Neuron* (Sridharan et al.). The study showed that music stimulates the part of the brain associated with paying attention, but this effect was invoked in an unexpected way. After studying the brain activity of subjects who listened to a classical symphonic recording while lying in a functional magnetic resonance imaging machine, researchers concluded that unexpected and unpredictable events in a musical structure have the power to arrest and hold the attention of the listener, and that listener attention peaks highest in the brief pauses between movements of a symphony.

These findings suggest various creative possibilities for us as game composers. Can we arrest and hold the attention of the player by challenging musical conventions and creating music that behaves in unpredictable ways? According to the Stanford study, this type of music has a strong potential to grab the player's interest, adding to those compelling sensory signals which Cairns and Brown have cited as prerequisites for total immersion. However, the most fascinating possibility lies in a direction that flies in the face of current practice. The common wisdom in game audio development includes a belief that it is best to knit together all the music elements of a video game into a seamless experience, without noticeable breaks between tracks. Given the findings of this study, should we reexamine this idea? Are pauses between music tracks truly a weakness in a game's audio design, or can they serve to stimulate the player's attention by challenging expectations? Is a dramatic pause sometimes better than a smooth transition? This is a question that can be pondered by both audio designers and game composers alike.

Prerequisite to Total Immersion #2: Empathy

From within the total immersion experience, empathy goes beyond developing a simple emotional attachment to the characters within a game. According to Cairns and Brown (2004), in order to reach the necessary state of empathy, the player must fully commiserate with the emotional turmoil that the characters suffer as they face various dilemmas and predicaments during the course of the game. Empathy involves not only an outpouring of pity, but also the inner process of imagining oneself in the same plight.

Music has been consistently shown to stimulate emotion in the listener, which gives us as composers the ability to

communicate the plight of the characters in many vivid and moving ways. But does this necessarily translate into a player feeling strongly empathic toward the characters and situations of the game? Can music enable sympathy and compassion, making empathy a more likely reaction?

A study published in the journal *Music Perception* from the University of California sheds an interesting light on this question. The study, entitled "Autism, Music, and the Therapeutic Potential of Music in Alexithymia," was an attempt to understand why individuals who could not understand or express their own emotions nevertheless both enjoyed music and used it as others do—to induce and regulate emotions in themselves (Rory and Heaton 2010). Autistic people could listen to happy music and feel happiness. Sad music could make an autistic person feel melancholy. Yet, these autistic people could not recognize or respond to emotions in other human beings. The study's authors attempted to understand why music had this unique power. They theorized that a person listening to music is in fact subconsciously picturing a persona that embodies the music they are currently hearing. In this way, music is theoretically perceived subconsciously as a human individual, expressing emotions just as a person might do with facial expressions and body language. When we are confronted with another individual expressing emotion, our natural response is to feel empathy, which then transmutes into the corresponding emotion that we have witnessed. In short, we empathize with the sad music, and then we feel sad ourselves. This empathic response is able to communicate itself to the autistic individual, bypassing the usual impediments that stand in the way of emotional comprehension.

This theory offers a tantalizing explanation for the power of music to evoke emotion. Moreover, the theory suggests that music may possess the key to attaining the state of empathy required to achieve total immersion. As composers, we should attempt to create music that focuses on the emotions of the characters with which the player should feel the strongest empathy, outlining those situations that evoke the most intense emotions. Our goal should be to help the player reach that state of emotional empathy that will enable total immersion to take place.

How Music Deepens the Play Experience

This brings us back to the whimpering, wailing, shrieking players of *Amnesia: The Dark Descent*. They are the culmination of the journey we have taken in this chapter—the final attainment of total immersion in all its glory. While not every truly immersive game will cause players to squeal in panic, they all share in common the ability to make gamers forget that they are playing a game. For a short while, these gamers have surrendered themselves to the fictional world of the game developers, entering the flow state that allows them to relinquish awareness of themselves and suspend their disbelief in favor of the plausible truths that the game presents to them. It is an inner equivalent of the holodeck of *Star Trek* lore or the constructed reality of *The Matrix*. However fleeting it might be, the experience of total immersion is unparalleled. As game composers, we have the fantastic opportunity to contribute to the creation of that experience.

4

The Importance of Themes

Every year, thousands of American gamers gather together to attend two major conventions: the Penny Arcade Expo in Seattle, Washington (otherwise known as PAX) and the Music and Games Festival (a.k.a. MAGfest) in National Harbor, Maryland. Crowds of enthusiasts pack exhibit halls, challenge each other in all manner of games from console to PC to tabletop, celebrate their love of geek culture, and party into the wee hours. They also attend officially sponsored rock concerts.

The venues are often packed with sweaty music-lovers, many wearing the usual jet-black of devout rockers (although some of these black t-shirts also feature video game logos). The audience whoops, throws their hands up in the sign of the horns, and jumps and thrashes in the true tradition of a mosh pit. The music at these concerts tends to favor heavy metal, although rap occasionally makes an appearance, and even some softer acoustic ensembles and funky jazz groups have been included. The headliners at these concerts aren't big names. They're mostly cover bands, but high-energy performances over the years have earned them a devoted following. In fact, these rock concerts resemble many that you might find anywhere in mainstream America, barring one exception.

"Encore! Encore! Encore!" shouts the crowd. The band has already finished their set. The stage is dark, but the audience still isn't satisfied. "Encore! Encore!" continues the chant, relentlessly. At length, the band returns to the stage, setting up for the demanded encore while the audience loudly revels in its success. The first notes of the encore performance are sounded, and someone in the crowd can be heard screaming, "Yes! Oh my God, yes! *Yeah!!! Woo!!*" The screen behind the band lights up to show the logo of the video game *Diablo III*.

This is a game music cover band. In fact, all the bands on the playlist are game music cover bands. The band currently performing the "Tristam Theme" from the *Diablo* series is called the OneUps, and they've played the PAX stage before. Video game cover bands like Powerglove, the Earthbound Papas, the Minibosses, and the Advantage are all veterans of the big shows like PAX and MAGfest, as well as some of the smaller shows (such as Nerdapalooza in Orlando, Florida, DEF-CON in Las Vegas, Nevada, and Bit Gen Gamer Fest in Baltimore, Maryland). Each band uses its unique sense of performance style to interpret the musical themes from beloved game series like *MegaMan*, *Metroid*, *Castlevania*, *Ninja Gaiden*, and *Final Fantasy*. Even the Russian folk-inspired music of *Tetris* has received heavy metal cover-song treatments. Moreover, game music cover performances aren't limited to just the gaming conventions. Relatively mainstream rock acts will occasionally record a cover version of a game track, such as when the Pixies recorded Brian Schmidt's theme song from the NARC video game (Audio Spotlight 2012). Still, the hardcore game music cover bands remain the driving force behind the movement. Every year, new bands join the veterans on the concert lineups. Each new band adds its own game music interpretations to the many others that have been performed and will continue to be revamped and reimagined year after year.

Why do these rock bands continually celebrate video game melodies? Film and television music can point to no similar phenomenon. Although film and TV music certainly can boast of its enthusiastic fans, cover bands like these are unique to the video game community. Why is it that these bands triumphantly perform the melodies of video games, like rock anthems for a geek generation? Why do audiences return again and again to hear the same video game tunes interpreted in different ways?

We know that a musical theme expressed within the body of a video game is experienced differently than themes in passive forms of entertainment, like television and film. In a game, a musical theme accompanies an activity that the players of the game are performing. The music has essentially become the soundtrack to the personal adventures of the players. When the music swells at a pivotal moment and a recognizable melody begins, the players hear that melody just as they are engaging in an activity they enjoy. This interactive engagement alters the way in which the music is heard and remembered. According to an article for *Topics in Cognitive Science* written by Michelene Chi (2008), psychology professor at Arizona State University, our ability to retain experiences,

process information, and successfully learn new things is directly impacted by how engaged we are at the time—therefore, interactive experiences are better than passive ones. So, does listening to a melody while actively playing a game cause us to internalize that melody more readily than hearing it while passively watching a film or television program? Is this why people develop such intense feelings about their favorite video game melodies?

Game music, like other forms of popular music, is experienced frequently while the listener is also doing something else. According to research conducted at the University of Geneva, the power of music to rekindle memories of emotional experiences from the past is due particularly to the pervasive nature of music in social life and during special activities (Scherer and Zentner 2001). Because music often becomes connected with the memory of an activity, it also acquires special significance and personal associations. For instance, a popular love song can instantly bring back memories of a first date, a rock anthem can reignite the memory of winning a particular sporting event, and a video game melody can bring back the memory of defeating a powerful boss. This may be the reason why game music cover bands exist. The relationship people experience with game music shares common ground with the place that popular music occupies in their lives. Both forms of music serve as the soundtrack to significant personal actions, and hearing the music associated with those actions has the strong potential to bring back vivid memories. Game melodies may in fact function as mnemonic ambassadors for the games from which they come, reminding players vividly of the fun they had while playing.

With this in mind, let's examine the concept of the musical theme as it relates to our work as game composers.

The Leitmotif and the Idée Fixe

Picture a young composer, dazzled by the beauty and talent of an actress he has just seen performing onstage. Immediately consumed by the fires of love and longing, he besieges her with a storm of letters professing his eternal devotion. Reading these letters, the actress shudders in horror at the apparent rantings of an insane fan. In what seems the most sensible decision, she shuns him. Denied the opportunity to ever meet the object of his desire, he turns his passion to his art and composes a symphony dedicated to her. Years later, she hears the symphony, and her heart softens a bit toward the "crazed fan" who had once seemingly stalked her. She agrees to meet with him. He wins her over, and they are eventually married.

Amid all the romance and tumult of young love, the composer Hector Berlioz also managed to create a pioneering symphonic work with profound implications for the future of musical composition, particularly as it relates to the creation of musical themes. In his romance-inspired *Symphonie Fantastique,* he presented a powerful thematic technique to the world. Berlioz would never use the word *leitmotif* to describe what he had done, although subsequent music scholars would point to this work as the first that had consistently and rigorously applied the leitmotif concept throughout the five movements of a symphonic composition. To Berlioz, however, the technique was to be known as the *idée fixe.* Though they are sometimes employed synonymously, to my mind the leitmotif and the idée fixe are hardly interchangeable ideas. It can be useful, especially for game composers, to consider these two concepts in light of the possible contrast between them. This point of view has the potential to afford us a construct for thematic composition that is very well suited to the video game format. First, let's discuss the two concepts.

The Leitmotif

Leitmotifs are not a new concept to the field of game music composition. In a research paper for *Mediated Perspectives: Journal of the New Media Caucus,* Dr. Joseph Defazio (2006) of Purdue University writes, "Composers in the game genre and other areas of New Media demonstrate the effective use of the leitmotif in their work." However, most people familiar with the leitmotif concept will be unlikely to initially associate it with video games. Musicians and composers may hear the term and think of *The Ring Cycle* operas, such as *Das Rheingold* and *Götterdämmerung.* Gamers and sci-fi fans may think of the music for the *Star Wars* films. Both examples are equally apt. The leitmotif (from the German, meaning *leading motive)* is a musical theme that accompanies a specific element in the dramatic work in which it appears. This may be a character, a location, or a unique situation in the plot. To put it simply, the leitmotif is an arrow trained on its own individual bull's-eye—it musically points toward a component of the overall work, drawing the audience's attention to it, and acting as a reminder and as reinforcement of crucial concepts.

Within the four mammoth operas of the *Ring Cycle,* music scholars have identified hundreds of unique themes. In the operas, the themes are often performed concurrently with the story concepts they represent in order to

cement the ideological relationship, and thereafter each theme is used to remind the audience of that particular idea, person, place, or thing. By virtue of this association, the music gains an additional communicative power beyond its intrinsic emotional resonance. For example, in the first opera of the cycle, the plot focuses on the Rhinegold, a magical metal that can be forged into a ring to make its wearer the ruler of the world. The Rhinegold is a critical concept in the overall story. To highlight this importance, it is assigned a unique and memorable theme, which repeats often throughout the course of that opera and the three others that follow it. This theme undergoes variations in many of its reappearances, reflecting the changing nature of the Rhinegold's significance as the story unfolds.
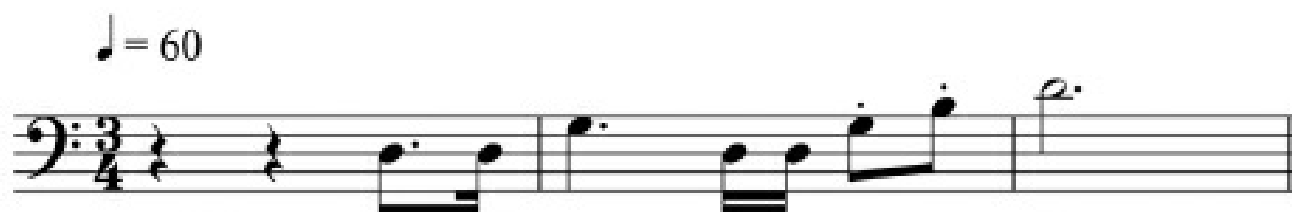
Figure 4.1
The Rhinegold theme.

Likewise, the *Star Wars* films feature numerous leitmotifs for characters, situations, and locations. The best known of these themes is the one belonging to the main character, Luke Skywalker, because it is also used as the main theme of the film itself. Heroic and uplifting, the theme for Luke Skywalker undergoes many transformations throughout the film. From noble and determined to somber and morose, Luke's theme helps the audience to emotionally connect with both the character of Luke Skywalker and his mission to free the galaxy from the evil Empire.
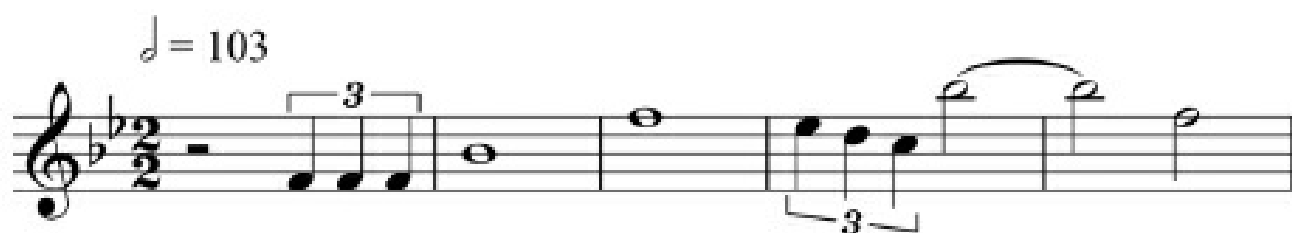
Figure 4.2
Luke Skywalker's theme from the *Star Wars* films.

In the world of video games, the most iconic expression of the leitmotif technique in action can be found in Uematsu's soundtrack to the classic *Final Fantasy VII* role-playing game (RPG), published by Square. Every major story element receives a recognizable theme, from the heroic main character and his various traveling companions, to the evil Shinra Corporation and its ruthless mission to uncover a new source of limitless energy, to the chilling final villain pursuing his apocalyptic master plan. Many of these themes are repeated within the game and some include distinct variations that change their character. This practice of highlighting story elements with leitmotifs was used frequently in the *Final Fantasy* game series as a whole. In his paper on symbolic illustration in music, Defazio (2006) points out the leitmotifs to be found in the *Final Fantasy VI* video game score, adding, "When used appropriately, the leitmotif can demonstrate a clear representation of a person, event or object providing additional auditory messages to the viewer." Such a clear representation can enable a composer to attach concrete meanings to abstract musical expression, turning a collection of melodies into a vocabulary of symbols and connotations that the composer can then use to communicate meaning to the audience.

This communication can include not only inferences about tangible aspects of the story such as a *Star Wars* character like Luke Skywalker, a *Ring Cycle* object such as the Rhinegold, or a *Final Fantasy* organization like the Shinra Corporation, but intangible ideas, as well. For instance, when a religiously devout character contemplates a morally unsavory action and the musical theme previously associated with religious faith is simultaneously reintroduced into the score, we can perceive that the music is telling us something about the character's inner conflict. As an example of this technique in action, we can look at a particularly effective leitmotif created by the

music composition team for the *Starcraft* series published by Blizzard Entertainment. In *Starcraft: Brood War*, a large air support ship of the United Earth Directorate's expeditionary force hovers over what appears to be a hopeless battle on a planet below, while a pair of military officers on the ship engage in a cryptic conversation about their commitment to an unnamed objective. All the while, a stirring operatic aria plays, and the music swells and crescendos as it eventually becomes clear that the ship is abandoning the desperate soldiers below to their inevitable deaths. In the sequel, *Starcraft 2,* that same aria plays more subtly in the background as a lone military agent is left to the mercies of hordes of swarming aliens, while another ship similarly leaves her to her fate. In this example, the leitmotif serves to link the two incidents together, reminding the player of a previous tragedy and making the current one more poignant. Using leitmotifs, music can deliver a wealth of subtext that is otherwise difficult to convey.

Figure 4.3
The aria from *Starcraft: Brood War.*

The Idée Fixe

Now we turn to the original concept executed by Berlioz in his *Symphonie Fantastique.* Although the concept of the idée fixe predates the leitmotif, they are often equated with each other. They certainly share characteristics in common. In my work as a composer I've had the opportunity to compose hundreds of themes. While I've found the leitmotif construct to be thoroughly useful, I've also had opportunity to reexamine the idée fixe, pondering whether these two terms were truly synonymous or if there was some artistic benefit to considering them as separate ideas. I'd like to suggest that the central driving theory behind the idée fixe is at odds with the concept of the leitmotif, and that as game composers we can use these two techniques independently and to great advantage. First, I'll describe the history and nature of the idée fixe, and then I'll relate an example of my own experience with it as part of my music composition for the video game *Assassin's Creed III: Liberation.*

Berlioz (1845) himself defined the idée fixe concept best in his program notes for *Symphonie Fantastique.* When he described the subject matter of this symphonic work in the program notes, he told the semiautobiographical story of a young composer stricken by the plight of unrequited love. In the symphony, the object of the young artist's desire quickly becomes an unshakable obsession with some unique musical properties —"the beloved image never presents itself to the artist's mind without being associated with a musical idea . . ." In other words, the woman he loves has become a haunting melody in his mind. This haunting melody appears repeatedly in every movement of the symphony, twisting and transforming into many contrasting expressions of the same musical statement. The theme is literally a *fixed idea,* permanently adhered to the consciousness of the leading character such that he can never be free of it. No matter where he goes or what he does, the melody follows him. In fact, the melody itself has so consumed the consciousness of the artist that it has taken the place of his beloved in his mind, representing not so much the literal depiction of her loveliness but the emotional upheaval that he now associates with her.

Figure 4.4
The idée fixe from *Symphonie Fantastique.*
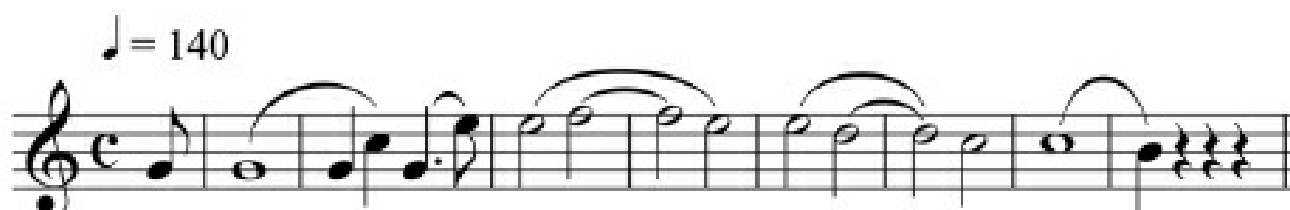
The theme may as well have been equated with "obsessive love" as with the identity of the woman in question,

as it ceases to be a faithful representation of her personality and instead is warped by the artist's feverish imaginings of her. Late in the symphony, when the artist eventually attempts suicide by poisoning himself, he relentlessly dreams of her while in a drug-induced nightmare that turns her into a demonic parody of herself. There is nowhere for him to escape. In this way, the experience of Berlioz's semiautobiographical lead character in *Symphonie Fantastique* can serve as a fairly literal interpretation of the meaning of the idée fixe. It is the idea that can never be escaped, omnipresent and formidable, ceaselessly meaningful.

Why is it useful for us to consider the idée fixe to be different from the leitmotif? It would seem as though the idée fixe could be considered as just another form of leitmotif, perhaps featuring a more intense emotional undercurrent. However, there is a subtle shade of difference to the definition of the two terms, and this difference can be beneficial for us to consider and perhaps apply in our own game music compositions. Within the boundaries of the leitmotif composition technique, a great number of melodies can be introduced, associated with various components of the drama, and used repeatedly throughout the work. An idée fixe, as originally described by Berlioz, is by its nature a singular phenomenon. Otherwise, it would lose its special significance. In this regard, an idée fixe may display unique properties that set it apart from all other themes.

If we decide to use an idée fixe (as Berlioz conceived it), then we should consider it to be the most important musical theme we compose for that game. Whether stated subtly or on an epic scale, the idée fixe should impress upon the listener a sense of meaningful weight and emphasis beyond what is to be found in other melodies. Like the leitmotif, the idée fixe should be flexible enough to allow its use in many circumstances. Unlike the leitmotif, however, the idée fixe should never become irrelevant or inappropriate because the story has entered a new phase or is concerned with new subject matter. From the beginning to the end of the game, the idée fixe should always be a compositional option. As composers, we should continually feel as though we can employ this special theme at any time and thereby add meaningful and significant overtones to the circumstances in which the theme is heard. Whether we actually choose to do so is another matter, but the idée fixe should always stand ready for us.

If we wish to keep the idée fixe functioning in a way that is completely separate from the means by which leitmotifs function, then it should not be associated with any aspect of the story or world that is limited in scope— that is, a single character, a specific location or object. While Berlioz associated his idée fixe with his "beloved" character, the musical theme he wrote was clearly not meant to allow us to faithfully conjure a mental picture of the woman in question. The theme takes on so many variants as to be more comfortably associated with the artist's obsession with her than with her literal appearance and personality. For a large portion of the symphony, her theme is meant to represent his fevered hallucinations of her. In this regard, she has become an *idea,* rather than a real person. The idée fixe is a representation of this idea. If the theme were meant to render a faithful representation of the woman herself, it would be far more limited in its usefulness. This is why an idée fixe is best associated with an intangible aspect of the story, whether that be a belief, an emotion, or a goal. Whatever it may be, this association should function as a central driving force in the overall story.

The Idée Fixe in Action: An Example from *Assassin's Creed III: Liberation*

The idea of a centralized musical theme in a game is not radical or new. The main theme of a game can be used as an idée fixe, if the composer decides to give it a symbolic connotation that allows it to resonate with meaning from within the body of the story. No doubt, the gamers among us can think of circumstances in which the main theme of a game has also returned during gameplay. These circumstances, however, tend toward the triumphant and climactic. A victorious reoccurrence of the main theme serves as an embodiment of the overall experience, perhaps communicating to the player how good it feels to be playing the game at such an epic moment. Does this also represent a meaningful idea within the game's storyline? Or would this more accurately be described as a feel-good reward for significant progress? In one of my more recent projects I had the opportunity to work with a centralized idée fixe, and also to grapple with the issue of how the main theme of a video game can effectively incorporate such a crucial symbolic element of the score.

In composing music for the video game *Assassin's Creed III: Liberation,* I was faced with a two-fold challenge: differentiate the game from others in the game series, while still reflecting the unifying elements that integrate the game into the rest of the *Assassin's Creed* saga. Unlike other *Assassin's Creed* games, this game would focus on an entirely new character that was in no way connected with any other character from the previous installments. Nevertheless, the game would still continue the underlying motivation present in all other installments—the quest for truth. "Fight to continue the search for truth, so that all may benefit," says Ezio Auditore da Firenze, the leading character of *Assassin's Creed II* (Futter 2011). This sentiment is echoed throughout that game and the two others that followed it (*Assassin's Creed: Brotherhood* and *Assassin's Creed: Revelations*) and would continue to be an

important motivation of the series moving forward. As expressed in an interview given by *Assassin's Creed II* cowriter Joshua Rubin (Incolas 2010), the search involves "unraveling large power structures to discover the truth underneath the surface."

Thankfully, the game's distinct geographical setting and the cultural influences asserted by the heritage of the main character assisted me greatly in differentiating the music I would write for *Assassin's Creed III: Liberation* from other scores within the series. After developing a plan to stress the distinct identity of the game via a culturally informed instrumental treatment and a system of recurring leitmotifs, I turned my attention to the issue of unification. I would need to assert a common ideological thread that would enable the music to enhance the sense of association between this game and the others that came before it. As the search for truth was clearly one of the central ideas in the overall story of *Assassin's Creed,* it seemed evident to me that I should attempt to associate that idea with the most important musical theme of *Liberation*.

The *truth* became the concept behind my idée fixe—both the quest to attain it, and those crucial moments when fragments of the truth would be revealed. Knowing that such a thematic motif should occur frequently, I constructed it to be as simple as possible, not only to make its repetition more easily digestible, but also to allow it the greatest possible flexibility for variation. I wrote the truth motif as a simple four-chord progression that incorporated preliminary upward movement symbolizing the yearning for answers, coupled with a tone cluster conveying uncertainty and a downward melodic turn to lend a shade of darkness to the overall effect.
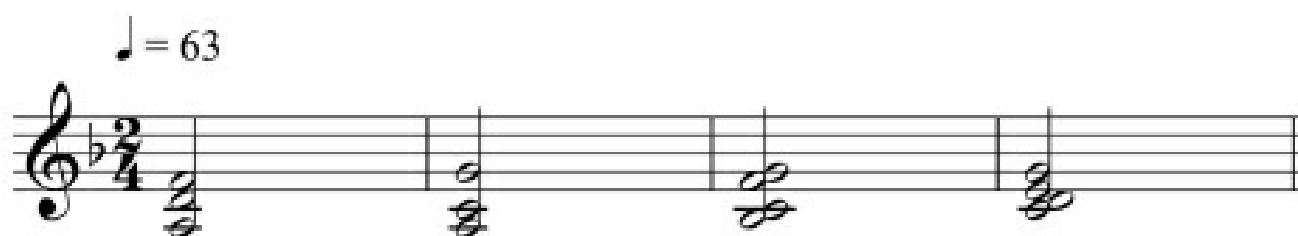
Figure 4.5
The truth motif from *Assassin's Creed III: Liberation.*

For its appearance within the main theme, I built the entire structure of the track around that four-chord progression, which repeated from the first notes of the track to its end. In this way, the truth theme first appears not as a motif but rather as a "figure." According to Roger Scruton, author of *The Aesthetics of Music,* "A figure resembles a moulding in architecture: it is 'open at both ends,' so as to be endlessly repeatable. In hearing a phrase as a figure, rather than a motif, we are at the same time placing it in the background, even if it is as strong and melodious as the figures used by Stravinsky in *The Rite of Spring*" (1999, 61). Using the truth theme in such a subtle way at the beginning allowed me to quietly assert its presence without drawing much attention to it initially. When the player first hears the idée fixe, there is no way of correlating it to the idea of a search for truth, since it occurs at the very beginning of the experience (when the story has yet to be revealed). Therefore, the idée fixe begins as a supporting mechanism. The primary focus of attention in the main theme is the statement of two separate leitmotifs that will later be associated with two critically important characters in the game.

Figure 4.6
The truth motif expressed as a figure during a stealthy sequence in *Assassin's Creed III: Liberation.*

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As the storyline of the game progresses, the idée fixe returns, sometimes as a subtle figure, sometimes with a more prominent thematic treatment. As a fixed idea that haunts the main character, this melody makes gentle appearances in many tracks, occasionally contributing to an understated and melancholic atmosphere, and other times punctuating a vigorous action track. The idée fixe is never far away, always hovering at the edges of the musical score and filtering through it, lending it a sense of restless yearning. Yet the moments in which the idée fixe assumes its greatest prominence are invariably when a truth is revealed, and in this way the meaning behind the idée fixe slowly rises to the surface. By the end of the game, this fixed idea has grown thunderously insistent, swelling when an important character reveals hitherto mysterious intentions or when another character lets slip a detail about the past that had been previously misunderstood.

In considering the idée fixe to be distinctly different from the leitmotif, we have afforded ourselves a useful construct for separating most of the themes we write for a game from the one central melody that lends a sense of unity and identity to the entire work. Considering the differences between the idée fixe and the leitmotif may also broaden our appreciation for the potential uses of thematic material within the construct of a video game.

Using Musical Themes in Video Games

We've talked about how melodies in video games are perceived differently from those heard in television and film, and we've examined the leitmotif and the idée fixe. Now, let's discuss the core functionality of the video game melody, exploring how we can successfully use melodies in games and how these melodies can best enhance the experience of gameplay.

What Defines an Effective Video Game Melody?

I assume that all of us are familiar with melody, and assuredly we all have opinions on what constitutes a strong melody. Our concern here is not subjectively aesthetic, but rather purely functional. How can we create a melodic theme that has the potential to be most enjoyable within a video game environment?

Outside of the context of a video game, we usually define a strong melody as being "catchy," "having a great hook," or "sticking in your head." As Grammy Award–winning music producer Tommy Lipuma expresses it, "The important thing about the melody is that it has something that you can't get out of your mind" (Blume 2008, 98). This may be why video game cover bands have such success creating new versions of those memorable game melodies that fans want to hear over and over again. But within the context of a game, the situation becomes more complicated. If a strong melodic theme is incorporated into a track that is played repeatedly, does that memorable melody begin to irritate rather than entertain? This has been an issue of great concern in the field of game audio, particularly in light of negative critical reviews in the press that have included such phrases as "incredibly repetitive" and "music cycles too often."

This problem is commonly called *repetition fatigue*, and we'll be talking more about how to address the issue in chapter 10, when we discuss looping tracks in greater depth. Because the issue has an impact on the composition of melodic themes, we'll also discuss it briefly here. Repetition fatigue occurs when a memorable or recognizable melody ceases to be entertaining and becomes an annoyance, either because the repeating track in which the melody appears is too short, or the track itself is repeated too often. The fear of repetition fatigue has led game developers to experiment with a multitude of alternatives. One of these has been to simply step away from musical themes altogether in favor of background figures, repeating patterns, and purely rhythmic tracks. However, this type of game music is also in danger of receiving negative press, with reactions such as "unmemorable," "unremarkable," and "forgettable."

According to researchers at National Cheng Chi University in Taiwan, "Above all, melody makes music memorable and enables people to distinguish one work from another" (Shan 2002, 97). We can conclude that in order for our music to make an impact and contribute positively to the overall video game experience, it must exhibit strong melodies. So, how can we adapt our melodic compositions to the demands of a video game score while keeping in mind the danger of repetition fatigue?

Instrumental Arrangement

A different instrumental arrangement can alter a theme in ways ranging from subtle to radical. Changing the instrumentation is the simplest of all thematic alterations, but can be highly effective. A theme that was originally

expressed with solo flute will sound dramatically different when a full brass section performs it. Likewise, a melody performed by electric guitar might be nearly unrecognizable when it reappears as the pedal tones of a cathedral organ.

The technique of varying an instrumental arrangement to alter thematic content was used effectively by the music composition team of *Resident Evil 2*, published by Capcom. In this survival horror game, the population of an entire town has been transformed into the undead by a biological weapon developed by a nefarious pharmaceutical company. As one of the remaining human survivors, the player fights to survive while unraveling the mystery of the bioweapon's origin. At some point in the game, the player encounters a mysterious new enemy that is in the process of mutating into a grotesque monster. During successive attacks, the enemy's transformation passes through several hideous stages. These stages are accompanied by the use of a memorable theme, which likewise transforms. In its first appearance, it is simply menacing and anxious, dominated by aggressive strings and a French horn that carries the melody. By the time the monster has reached his final grisly mutation, the theme is now performed flamboyantly by an operatic soprano, lending the entire arrangement a sense of horrific grandeur. Such a simple change as an alteration of the instrument carrying the melody can have a profound effect on the impact of a composition.
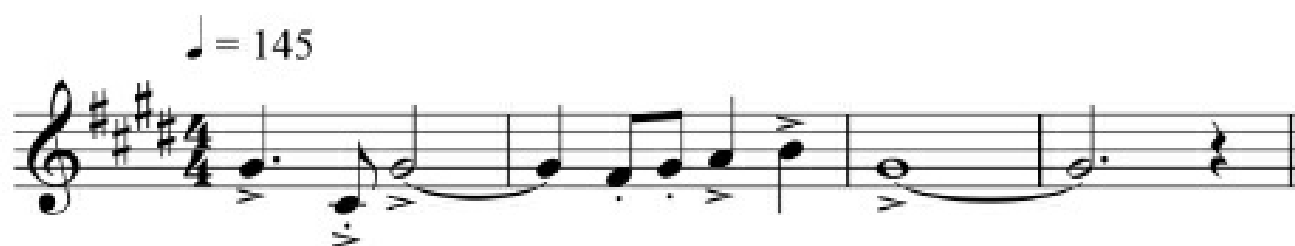
Figure 4.7
Transformation theme from *Resident Evil 2*.

When devising melodies, particularly when they are to be used in the capacity of leitmotifs, it becomes important to evaluate their flexibility in regard to alternative instrumental treatments. At this point, it is beneficial for us to be open-minded about the possible permutations of a theme. Sometimes, when we create a melody of which we are particularly fond, we have trouble imagining it executed in a way other than what we had originally intended. That ethereal phrase of longing performed by a solo soprano can also become a more guttural expression of loneliness and despair when interpreted by a bassoon. However, if our emotional attachment to our initial instrumental treatment causes us to be unwilling to experiment with these possibilities, then we may never fully realize the potential of our motifs.

Generally speaking, the possibilities are nearly limitless regarding instrumental treatments, and it is in the best interests of the game to approach thematic material using multiple instrumental strategies. However, for the video game composer, instrumental choices may also be limited by gameplay factors. If a musical instrument is strongly associated with a particular character whose musical theme or motif may be triggered whenever they appear, then it might not be possible for that instrument to appear elsewhere in the score because it would then seem to be delivering misinformation to the player. Hearing that musical instrument might be perceived as a clue that the associated character would soon arrive, and if he or she does not eventually show up, it could cause confusion. Similarly, if a short piece of music indicating success was characterized strongly by its use of one distinctive instrument, then it might not be possible to use that instrument elsewhere (for fear of communicating success when it had not occurred).

Strictly in terms of leitmotif usage, if we make the decision to always express a certain leitmotif with a certain instrument, then we may also need to be careful about the use of that instrument elsewhere. Using varying instrumental treatments with our themes allows us to keep our options open, while simultaneously introducing a sense of uniqueness to these reappearances of thematic material within the body of the score.

Variation and Fragmentation

One of the more interesting methods of adding variety to the presentation of a melodic theme is by creating variations of the theme. There are endless ways to accomplish this, and I find it to be one of the more intellectually stimulating and enjoyable aspects of being a composer. After writing the original melody, we can now analyze that melody, looking for opportunities to alter its structure. Perhaps the initial upward movement of the first phrase may

be reversed, the major mode may become minor, or the rhythms may be altered while leaving the note values unchanged. The joy of devising variations on a theme is that there are always numerous possibilities, depending on the musical effect we wish to achieve. For the video game composer, the theme-and-variation technique allows us to continue to assert a sense of thematic unity throughout the work while avoiding repetition fatigue.

Fragmentation is another way in which we may continue to assert a theme while instilling a sense of freshness and novelty to it. To accomplish this, we examine our initial theme for its most basic motifs—the smallest unit of musical expression that still maintains a recognizable identity. Using only a smaller phrase from the larger melody gives us the chance to take the melody fragment in a completely new direction. For instance, we can set this small portion of the theme against a more stark and primal arrangement that emphasizes its comparative simplicity. Then again, we can decide to use this thematic fragment as a repeating background figure, setting another melody against it (perhaps even combining it with a secondary leitmotif whose symbolic meaning would be heightened by the association with this thematic fragment). The multitude of possibilities enables us to flex our creative muscles and have more fun with our work.

Theme and Variation in Action: An Example from *Assassin's Creed III: Liberation*

Let's explore an example of this technique. For the purpose of convenience, I've chosen an example from the *Assassin's Creed III: Liberation* game that we discussed previously in the section about the idée fixe. *Liberation* is a game driven by its story, with a rich atmosphere and complex characters, and all this makes it perfect for a highly thematic approach. I composed a series of leitmotifs for characters and locations in the game, including a theme for an aristocratic elder statesman. Warm, tender, and fatherly, this character provides both a loving home and a tradition of culture and honorable behavior. In my mind, the emotions attached to this character could be broadened to equate with a love of one's homeland and an adherence to one's principles. I used this leitmotif frequently in the overall musical score of the game.

Figure 4.8
The beginning of the theme for an aristocratic elder statesman character in *Assassin's Creed III: Liberation.*

The first appearance of this leitmotif is also the fullest expression of the theme, which happens to be one of the longest and most complex melodies in the game. As a sophisticated and well-educated man of the eighteenth century, the elder statesman is a product of the Age of Enlightenment, and the initial statement of his theme needed to express all of these characteristics. The theme also needed to radiate a sense of warmth and welcome. The theme was originally written in simple three-quarter time, with the tempo moving in a relaxed *andante*—a relatively slow tempo. I confined the instrumentation to a woodwind soloist, a harpsichord, and a chamber string ensemble.

I used this theme again during a high-society party to instill in this location an equal sense of culture and tradition, as well as to subtly remind the players that our aristocratic elder statesman character belongs to this sophisticated world. In this second incarnation, the theme was set to a *marcia moderato*—a moderate march tempo. The melody was adapted to the new time signature (which necessitated some rhythmic changes), and was further augmented with Baroque ornamentation. The instrumental ensemble included the addition of a full woodwind section along with chamber strings, harpsichord, and a set of timpani.

Figure 4.9
A variation of the "elder statesman" theme, used during an elegant party.

I used the theme yet again for two action-oriented sequences during the game. The gameplay in these sequences is motivated by the goals of protecting one's homeland and upholding one's beliefs, which made the use of the theme seem resonant and appropriate. I set both pieces of music in common time with an *allegro* tempo (a quick pace that matched the action), but the musical theme itself was employed in dramatically different ways. In one track, I used the first eight bars of the theme as originally stated (although adapted to the common time signature), then launched into a variation involving a dramatically altered chord structure. The theme was performed by solo violin and backed by a contemporary ensemble that included modern rhythm instruments and brass. The second action track did not actually feature the melody at all but was instead based on the underlying chord structure of the theme, executed by the full string orchestra set against contemporary percussion.

Figure 4.10
A second variation of the "elder statesman" theme, performed by solo violin during an action sequence.

In addition to these appearances during gameplay, I also used this theme three more times during dramatic points in the narrative. In one instance, the violin section states a short fragment of the theme during a narrative sequence in which the strongly held beliefs of a character are openly mocked. I thought that the insertion of a motif associated with honorable behavior and strong beliefs created a subtle sense of irony in this context. In the second narrative usage, the entire string section states the theme in a minor mode, during a conversation about the past in which the aristocratic elder character is mentioned favorably. Finally, the theme makes its most emotional appearance when expressed by solo violin backed by harp, during a melancholy sequence of events involving the elder aristocrat.

As we've seen in this example from *Assassin's Creed III: Liberation,* we can use variation and fragmentation in order to restate a single theme in numerous ways while avoiding too strong a sense of familiarity that might lead to repetition fatigue. In order for these variations to be successful, however, the underlying themes must be flexible enough to be used within many different modes and styles of arrangement. When we first write a theme that we intend to use as a leitmotif (and particularly if we are considering it to be an idée fixe), we should attempt to imagine the theme in as many variations as possible to make sure not only that the theme has sufficient flexibility but that it will inspire us to think of an abundance of possibilities.

How Musical Themes Enhance the Experience of Gaming

Video games offer two simultaneous experiences—the drama and impact of narrative, and the stimulating engagement of play. We've discussed the role of musical themes in enhancing the effect of storytelling, and we've also explored some of the ways in which thematic approaches can interact with the gameplay experience. We know from our previous exploration of immersion that music has the power to assist the player in establishing a deeper psychological relationship with gameplay, both on a cognitive and emotive level. How can musical themes, and particularly motifs such as the leitmotif and the idée fixe, help players play games more successfully and enjoy the experience more while doing so?

We know from their use in other forms of media such as television and film that musical themes have the power to delineate elements of the narrative from one another. In the *Star Wars* films, the Luke Skywalker leitmotif infuses his character with a specific emotional undercurrent that belongs only to him, and it sets him apart from other characters in the films. In the *Ring Cycle,* the leitmotif for the Rhinegold emphasizes its magical power and reiterates its narrative importance throughout the four-opera work, setting it apart from all other aspects of the saga. Likewise in *Resident Evil 2,* the theme for the mutating monster establishes his moral and physical repulsiveness, stressing his presence as the ultimate antagonist and setting him apart from the other enemies in the game. These are ways in which music allows the audience to mentally compartmentalize the world that the dramatic work presents, which in turn facilitates the assignment of special meaning to specific characters, locations, items, and ideas.

The concept of musical compartmentalization extends naturally to the video game construct. Musical themes are ideally positioned to help game players mentally organize the game world and emotionally interact with it. Musical themes for characters may be used to help players identify friends and foes, or interact with in-game characters in a more emotionally satisfying way. Themes for locations allow players to differentiate their current locale from the many others that they will experience during the game. Location-specific themes also enable players to develop deeper sentiments about their surroundings. Themes appearing during significant events serve to make those events more memorable and prepare players for similar subsequent occurrences, which can also be scored either using the same leitmotif or one of its many possible variations. Finally, the idée fixe can draw the attention of the player to a single idea of significant importance, lending focus to the narrative and providing a centralized motif that binds the musical score together into a unified work.

Conclusion

The leitmotif and the idée fixe both have an enormous power to symbolically communicate. These musical themes when used in video games can be rousing, entertaining, and profoundly memorable. In fact, the continuing popularity of game music cover bands is a testimony to the love that players feel for their favorite game melodies. Using a symbolic language, themes communicate eloquently, and give game composers a voice with which to speak directly to the player. This voice becomes an important tool for the game composer, and one of the most powerful ways in which we can express our artistry and our passion.

5

Music Genres and Game Genres

Walking through one of the wide hallways of the Los Angeles Convention Center during a busy day at the Electronic Entertainment Expo (E3), I found my pace settling into a steady rhythm. I was nodding my head to the beat. My shoulders were jogging a little with the syncopation. If it weren't for the bright sunshine streaming in from the massive wall of windows to my left, and the hundreds of footsore convention goers carrying bags of expo floor swag as they streamed by on either side of me, I might have thought I was walking through a particularly edgy LA dance club. As I passed by the doors to one of the special demonstration areas and the music level peaked, I continued my steady walk to the beat of "The Revolution" by electronica artist BT. Why was this song sending its massive *thump-thump-thump* across the crowd, so that we could all feel the deep rumble under our feet? It was obvious, and I didn't even need to glance over my shoulder to know what was going on. This was all to promote Nintendo's newest console, codenamed *Revolution.*

At that time, in the summer of 2005, no one knew much about the Revolution. It was a sleek, petite black box, with a long vertical strip that would glow blue when the console was powered up. In Nintendo's press conference immediately preceding the convention, Satoru Iwata, president of Nintendo, described the Revolution as a console that would "create entirely new genres to expand the definition of video games" (Morris 2005). Projected launch games for the Revolution included some of Nintendo's best known and most beloved game franchises (*Mario, Metroid, The Legend of Zelda*). It looked like the future of Nintendo would focus on the core audience of fans who had bought and played their products since the first *Super Mario Bros.* in 1985.

Certainly, Nintendo's choice of this song for use during E3 2005 seemed to support the idea that the new console would cater to the core audience of gamers. The song featured angry guitar riffs, military rhythms, distorted synths, and shouted rap vocals interrupted by rhythmic static glitches that added emphasis to the syncopation. It seemed like a perfect song choice for Nintendo—a track prominently using the console's name and embodying the hi-tech defiance of gamer culture.

The only hint of the truth about the Revolution at E3 2005 came when Nintendo suggested that the console would be accessible to everyone in the family. However, this tiny nugget of information paled in comparison to the big mysteries that everyone was clamoring to solve. What were the technical capabilities of the console? What would the controllers be like?

A year later, when Nintendo finally answered all those questions, it took everyone by surprise. The name would not be *Revolution;* it would be *Wii* (pronounced *Wee).* The console would feature user-friendly motion controllers that would break down barriers between core gamers and uninitiated non-gamers, allowing new players to get their feet wet using a control scheme that didn't intimidate them. The console would not be stark black—instead, it would be a crisp white with a glossy shine. It would be sold with a family-friendly game already included in the box: *Wii Sports.*

Of most interest to us as game composers is the change that occurred in the musical marketing of the console. The television commercial for the Wii in 2006 featured two Japanese black-suited gentlemen driving a tiny blue-and-white smart car, knocking on doors and presenting a game controller while saying, "Wii would like to play." The recipients of their visits included conventional nuclear families, women, seniors, teens, blue collar workers, and hip young adults . . . clearly Nintendo's intent was to show a broad appeal to gamers and non-gamers alike. The music in these commercials was "KODO Inside the Sun Remix" by the Yoshida Brothers. It consisted of a traditional Japanese shamisen performance set against a bright and energetic pop beat. Gone were the angry guitars, the military rhythms, the distorted synths, and the shouted rap vocals. If BT's track could be perceived as a rebellious proclamation of gamer culture, the Yoshida Brothers' track might be seen as a major step *away* from that culture. In this music choice, Nintendo had sent a subtle but powerful message about the demographic they were now interested in serving.

Music and Demographics

"For anyone interested in a social understanding of music, the experiences of advertisers are ripe for the plucking," writes music psychologist David Huron (1989, 559) in an article for Oxford University Press. "Musical styles have long been identified with various social and demographic groups. Musical style might therefore assist in targeting a specific market."

As game composers, we may not think of ourselves as composing music in order to "target a market," but whether consciously or not, we're usually doing just that. Video games are classified into an assortment of genres. Each genre delivers a unique play style, and may also display a form of atmosphere and energy level that typifies games in that category. Most important, game genres each have a strong appeal to their own specific target demographic. The game developers are well aware of this, and have designed their games with the likes and dislikes of their target demographic in mind. When the development team asks us to create music in a specific style, their choice might have been directly influenced by the musical tastes of their target demographic. Likewise, when we study the music styles of other representative games in the genre of our current project, we're likely absorbing and internalizing demographically inspired choices.

Our foremost goal as game composers is to create great music that will enhance the enjoyment of the player. While keeping demographics in mind may feel to us as though we're being motivated by less-than-artistic considerations, it's good to remember that significant art can be achieved while also compensating for factors that have nothing to do with art. Personally, when I get frustrated by limitations I usually remind myself that baroque composer George Frideric Handel created his *Water Music* with instructions from King George to fashion a work that could be performed on a floating barge on the Thames River, with the audience bobbing all around on many barges of their own, and the noise of the Thames competing with whatever music might be presented there. These circumstances certainly imposed some challenging limitations for Handel, but the result remains one of the finest examples of baroque orchestral music ever written. Limitations don't have to stand in the way of composing meaningful and artistic music. They may guide us in unanticipated directions, coaxing inspired musical choices from us that might not have otherwise occurred to us.

If we are to consider the player's musical tastes, then we need to understand the particular community of players that our game project is targeting. Each video game genre appeals to a specific segment of the gamer public. Browsing through the reviews section of the video game news site *GameSpot.com*, I saw thirty-six video game subgenres listed, ranging from first-person shooters to party games. That being said, this multiplicity of play styles can be simplified into a more comprehensible model that can help us understand gamer personalities and preferences, including musical inclinations. Let's take an investigative journey through this world of game genres and gamer demographics, one step at a time. So, what do we need to know first?

The Target Market of a Video Game

Contract game composers are typically hired late in the game's development schedule. In all likelihood, the developers have already settled on a target market for their game by the time they hire us. Even so, if there is any possible doubt regarding the nature of the intended target demographic, this can become troublesome for the game composer down the line. The target market is a *crucial* factor for everyone involved, including the composer. The musical tastes of the target market usually have a direct bearing on the nature of the music we are asked to compose. If that target market were to change in the middle of music production, it could render previously approved tracks suddenly unsuitable as the developers scramble to choose a new musical style for their redefined audience. Needless to say, everyone would like to avoid such a mid-production scramble, and every effort will be made to conclusively decide on the nature of the game's target demographic as early as possible.

How do developers define their target markets? Some development studios simply create games that will appeal to people who share the same tastes as their own employees. While this narrows the target demographic down quite a bit, it also limits that studio's potential to broaden its audience. Other developers attempt to pursue the highly dependable "hardcore" demographic of veteran gamers who play lots of games, spend lots of money on their favorite genres, and are thought to favor high-octane experiences laced with mature content. However, some diversity does exist within this particular gaming community, making it risky to formulate design decisions based on assumptions about their tastes. When a developer chooses to step back from personal partialities and look at the nature of the gaming audience in a purely objective fashion, the great range of personalities, play styles, and

preferences can be staggering.

To deal with these overwhelming variables, focus testing is widely employed by development studios, game publishers, and even scholarly researchers. In a study conducted at the Eindhoven University of Technology in the Netherlands, researchers described focus groups as "an innovative approach to study game related behavior," adding that focus groups enable researchers to "explore differences in game experiences according to player type, game genre, and context of play" (Poels, de Kort, and IJsselsteijn 2007, 84). When conducting a game industry focus test, a studio or publisher will bring in a group of people to play a game while it is still in development. Afterward, these people will fill out questionnaires that explore their reactions to the gameplay experience. Focus tests can shed light on how players interact with a game's aesthetic design, user interface, and play mechanics. But what does a developer do when a game is not yet in a playable state? Where can developers (and game composers like ourselves) find more general information about player preferences?

There are several scholarly "models" that attempt to explain video game player inclinations. These models tend to be based on player impressions gathered either informally or through the use of questionnaires, much like the data gathered at the end of focus testing. Author and game design pioneer Richard Bartle (1996) categorizes players into four distinct personality profiles: socializers, killers, explorers, and achievers. This model does not indicate what types of games would be enjoyed by each personality profile, since the article focuses on the players of only one type of game—text-based Multi-User Dungeons, or MUDs. Research scientist Nick Yee (2007) created a more elaborate model of personality types, but he confined his research to players of MMORPGs. A third model, however, explored a method for describing and categorizing both player personalities and the types of game genres that these disparate personality profiles would likely enjoy. This study is particularly useful to us as we attempt to compose music that would entertain the target market of our game project. First, let's take a look at this model of gamer personality types.

DGD1: A Model of Demographic Game Design

Game researchers Chris Bateman and Richard Boon (2006) conducted the study using a two-pronged approach: they presented two separate questionnaires to a large pool of study subjects. One questionnaire gathered statistics about game-playing and purchasing habits, and the other was a thirty-two-question personality test based on the famous Myer-Briggs Type Indicator (MBTI). The Myer-Briggs test was first developed during World War II to aid women who were entering the workforce for the first time and didn't know what sort of jobs might best suit their innate temperaments. Since then, the test has been used heavily as a measure of personality characteristics. For the purposes of Bateman and Boon's research, the MBTI was able to identify some specific aspects of the personalities of his study subjects. Here are a few examples of the sorts of characteristics that were revealed:

- A propensity to be outgoing and comfortable in large groups
- A willingness to think ahead and embrace imaginative ideas
- An inclination to consider the feelings of others when making decisions
- A tendency to prefer planned rather than spontaneous action
- A predisposition to engage in conflict or to consider conflict to be acceptable

The thirty-two questions of Bateman and Boon's adapted MBTI test allowed them to sort the study subjects into groups, depending on their responses. These results, coupled with the questionnaires regarding game-playing habits and preferences, painted an interesting picture of the gamer community and the personality types that could be found within it.

After examining the completed questionnaires, Bateman and Boon discovered that four distinct gamer personalities had emerged into which the study respondents could be categorized. They gave these categories descriptive names: *Conquerors, Managers, Wanderers,* and *Participants.* Conquerors are fiercely determined players, unwavering in their quest to "beat" the game. Triumph provides Conquerors with an intense burst of emotional satisfaction that serves as the ultimate reward for their efforts. For Manager players, victory is not about "beating" the game but mastering all of its required skills. Managers excel at keeping track of many simultaneous variables that require monitoring and adjustment. In contrast, Wanderer players are interested in neither victory nor mastery and would rather be plunged into an immersive environment offering bountiful opportunities for exploration. Finally, the Participant is the most social and emotional player type, preferring games that involve interaction with other people as well as stories that include compelling characters.
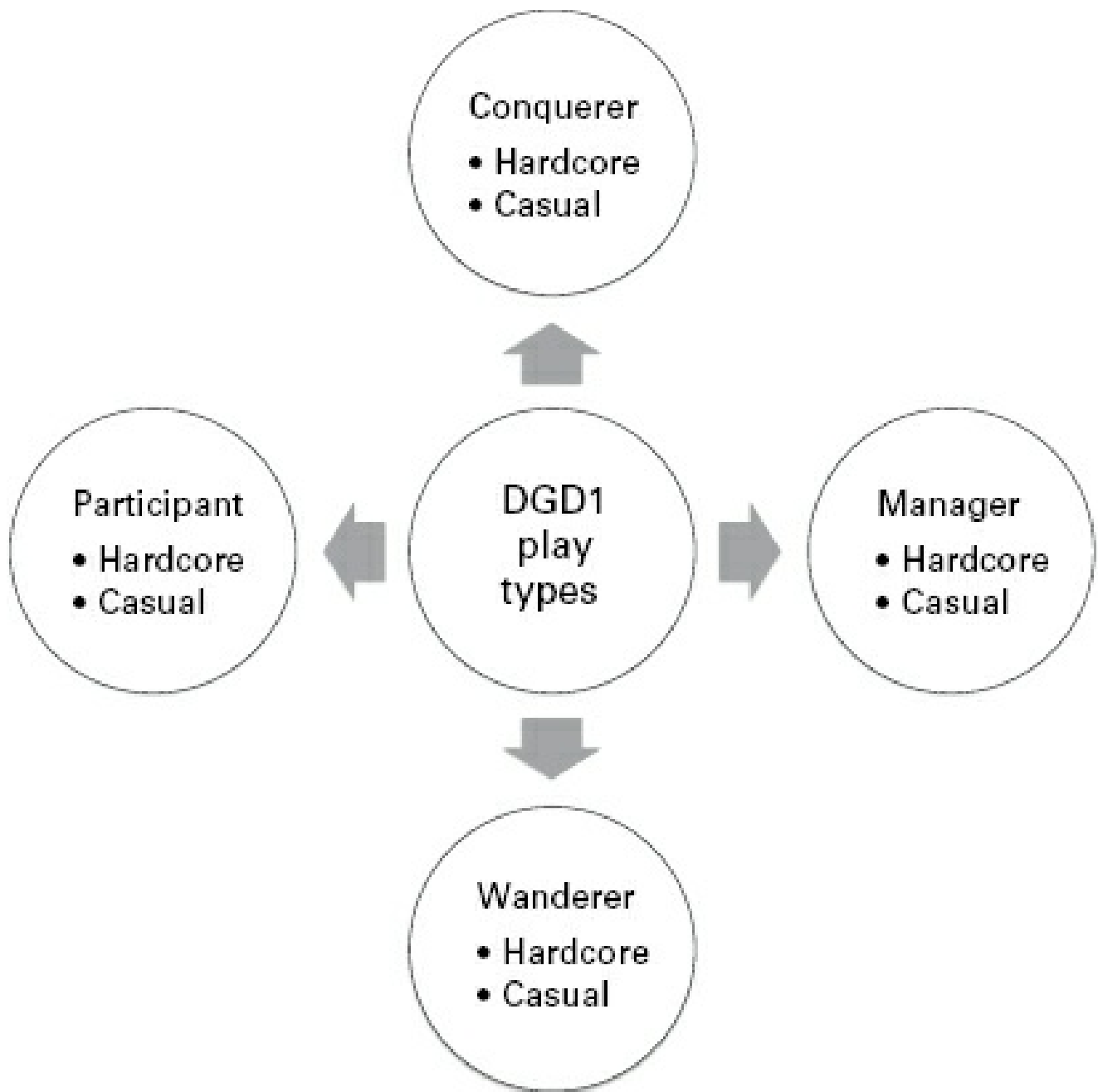
Figure 5.1
The player types revealed by Chris Bateman and Richard Boon's 2006 Demographic Game Design research study.

Bateman and Boon further refine these results with two important modifiers for each category: *Hardcore* and *Casual*. Hardcore gamers play lots of games, play for a longer time, are willing to learn complicated procedures, and are likely to talk about games with their friends and represent gaming as a part of their identity. Casual players play a smaller collection of games in shorter play sessions, prefer games that are less complicated, and view gaming as a pastime rather than a lifestyle.

What matters most to us about Bateman and Boon's study is their pairing of certain game genres with certain player personality types (we'll be discussing these game genres and their associated player types later in this chapter). The correlations in the study and the resultant Demographic Game Design model (DGD1) can help us find the personality type most closely associated with our current project. Armed with this knowledge, we can then imagine the unique emotional journey that the target personality type would experience while playing a particular game. Putting ourselves in the mindset of the Conqueror opens up a very distinct range of emotions, suggesting musical strategies that represent the ferocity and determination of this player type. On the other hand, music for the Wanderer mindset may be characterized by that sense of wonder and discovery typifying a constant desire to reach beautiful new horizons. Understanding the ways in which the Hardcore and Casual modifiers change the meaning of each personality type provides additional references that help to ground us and focus our work. Combined, these

player characteristics can offer insight that has the potential to fuel our creativity while at the same time ensuring that our music rings true with its intended audience.

While this can all be helpful in a general sense, an important question has yet to be addressed: is it possible to determine the general *musical* tastes of each of Bateman and Boon's player styles? Is there a way to establish what genres of music have the potential to best enhance the specific genres of games that these players most enjoy?

Music and Personality

In the attempt to consider this question, we can rely on some additional scholarly research to provide us with thought-provoking ideas. While the research of scientists should never supersede our own judgment when it comes to musical choices, it can afford us the opportunity to feed our creative consciousness with interesting and provocative possibilities. We do not need to fully accept such studies in order to find them creatively stimulating. When contemplating possible correlations between musical styles and personality traits, we can turn to the fields of psychology and musicology for some fascinating viewpoints on the subject.

In a study published in the *European Journal of Personality,* researchers collected statistics from a large pool of study participants to determine whether personality characteristics could be directly correlated with specific genres of music (Delsing et al. 2008). For the purposes of their study, they categorized musical styles into four large genre groups. The study subjects were given several comprehensive questionnaires, including the Music Preferences Questionnaire (MPQ) and an assessment of personality based on a psychological construct known as the *Big-Five*. This construct sorts personality characteristics into five general areas of interest: Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness to Experience. With thousands of completed questionnaires in hand, the researchers looked for correlations between personality types and musical preferences, and their findings can provide us with some remarkable food for thought.

Before we consider these results, though, we'll need to take a look at the four big groups into which the researchers sorted musical genres: *Rock*, *Urban*, *Pop/Dance*, and *Elite*. The Rock category would seem to be fairly self-explanatory. It contains the subgenres heavy metal, hard rock, punk, hardcore, grunge, and gothic. The Urban genre encompasses the musical styles of hip-hop, rap, soul, and rhythm-and-blues. The Pop/Dance category includes trance, techno, and all those genres that commonly appear on the "Top 40" chart. Finally we come to the category with the controversial name—Elite. This category includes jazz, orchestral music, and religious music. Setting aside whether we think this music is elitist or belongs to some upper echelons of society, the category itself (regardless of its name) is useful to us as we think about how musical genres correlate with personality characteristics.

Here we come to the most important part of the study from our perspective as game composers. The study demonstrates a few provocative connections between personality traits and musical styles. The respondents showing the highest level of introversion were also most likely to enjoy the Rock category, whereas those who were scored to be outgoing extraverts were most likely to enjoy Urban and Pop/Dance styles. People who showed the most eagerness to embrace new experiences were also likely to enjoy both Rock and Elite music. The respondents who tended to think ahead and avoid spontaneous action were also likely to enjoy the Elite musical style. Those people whose temperaments led them to think often of the welfare and feelings of others were likely to enjoy the widest range of music, including Urban, Pop/Dance, and Elite.

What makes this so useful is the fact that these personality traits can be paired with similar traits in the DGD1 model of researchers Bateman and Boon. Since there are correlating characteristics between the two studies, this allows us to draw some connections between music preferences and the DGD1 play styles of Conqueror, Manager, Wanderer, and Participant. Going a bit further, we can look at the specific game genres that these player types enjoy most, and we'll begin to see connections forming between preferred music styles and preferred game genres. These connections can be fascinating, particularly as we see that the musical history of each game genre seems to add support to these conclusions. It's a unique way to look at the musical traditions of video game genres, allowing us to consider how our music may fit into the experience of a game's target market.

Connecting Music Genres to Game Genres

We often find ourselves relying on history to show us how music is used in specific genres of games. Still, it can feel

unsatisfying when we make a musical choice because "that's how it's always done." It's natural to wonder why a specific type of music is so often linked with a specific type of game, and why composers and developers have made these musical genre choices over and over again. While there are no definitive answers to these questions, we can use the research studies we've discussed in this chapter to examine the array of video game genres that exist today. These genres include:

- Shooters

- Platformers

- Adventure

- Role-Playing

- Survival Horror

- Racing

- Simulations and Life Sims

- Strategy

- Puzzle

- Fighting

- Stealth

An examination of these genres may deepen our appreciation for their musical traditions, providing a little bit of insight into why certain musical choices might have been made in the past and how these choices have enhanced the player's experience with the game. So let's begin our discussion of the major genre divisions of modern video games.

Shooters

This has long been considered one of the most potentially lucrative game genres in the industry. Blockbuster franchises such as *Call of Duty*, *Medal of Honor*, *Ghost Recon*, *Battlefield*, *Borderlands*, and *Halo* have earned enormous amounts of money for their publishers and developers. For this reason, many new development companies will attempt to "grab the brass ring" by creating a shooter game in the hopes that it will enjoy success and subsequently expand into a multibillion dollar franchise. However, hitting on the magic formula for a successful shooter is not an easy task.

In a shooter, the player does exactly what the title of the genre suggests—the player shoots things. While the activity of shooting things may pop up in other genres of games, in the shooter it is the primary task. The player will carry an assortment of weapons, each offering different performance advantages and drawbacks. While classic shooters require accurate targeting and speedy reaction times in order to achieve success, modern shooters often make the situation more complex by requiring the player to seek cover from enemy fire.

According to Bateman and Boon's DGD1 theory, the personality type most associated with shooters is the Conqueror, who revels in the fast-paced challenge and is determined to eliminate all enemies and accomplish all objectives. When we look at some of the personality characteristics of the Conqueror—an introvert who embraces conflict and uses logic to formulate methodical plans—and compare these with personality traits of the music preferences study (Delsing et al. 2008), we see some strong musical inclinations emerging. According to the music preferences study, for the introvert who plans ahead and embraces conflict, the strongest musical preferences exist in two genre groups: Rock and Elite.

Studying the music styles that characterize the scores of recent shooter games, we notice a very strong inclination toward the guitars and drums of rock combined with the epic drama of the "Elite" orchestra. The Rock category may manifest subtly in some shooter games, with a touch of rhythm guitar coupled with distinctive rock rhythms in the drums. In other shooters, the rock elements will take center stage, with aggressive guitars in the style of heavy metal or hard rock. There are also shooter games in which the Elite musical elements take priority, rousing the player into action with passionate orchestral flourishes while the rock elements create a subtle background momentum. Sometimes these scores will incorporate choral elements evoking religious fervor (in the case of the *Halo* series, this religious quality is blatant, as the choir consists of an ensemble of men singing in a style strongly evocative of Gregorian monks). Thus, the Elite element is occasionally present in both its orchestral and religious

forms. Finally, in such games as *Call of Duty: Black Ops*, *Borderlands 2*, *Bulletstorm,* and *Halo: Reach*, these two musical genres are consistently combined, resulting in dark, rhythm-oriented musical scores with the drive of rock and the grandeur of a symphony.

Platformers

While a description of the shooter genre can be simplified as "games in which the player shoots things," for platformers, the simplest description would be "games in which the player jumps on things." We might also qualify that statement with the addendum, "games in which the player also falls off things," since the ability to fall to one's death is a vital characteristic of the platforming experience.

Platformers can be quite visually acrobatic, as the central player character performs nimble leaps from one precarious perch to the next, reaching out to grab a handhold at the last moment to prevent a fatal fall or balancing delicately on ledges set at dizzying heights. There can be an almost dance-like quality to this movement, particularly when the character is navigating a difficult platforming sequence at high speed. Since the primary gameplay mechanic of a platformer centers on traveling from one point to another while navigating a hazardous environment, the beauty, spectacle, and ingenuity of the locations will take on a special significance. Platformers have often been blessed with some of the most artistically inventive visual presentations of any game genre. From such blockbuster game franchises as *Prince of Persia*, *Sly Cooper*, *Portal*, and *Rayman*, to individual games such as *Fez*, *Braid*, and *Limbo*, the entertaining locales and devious challenges keep platform gamers on their toes.

According to the DGD1, the player type most closely associated with the platform game is the Wanderer, who takes greatest delight in exploring stunning worlds with countless opportunities to discover new panoramas that please and tickle the senses. For the Wanderer, the challenge of platforming is amply rewarded by the joy of reaching a new environment. When we compare the personality characteristics of the Wanderer—an emotional individual who is open to imaginative ideas, dislikes planning ahead, and focuses on the feelings of others—with those corresponding traits from the music preferences study, we find that a Wanderer may have the most eclectic musical tastes of all the DGD1 player types. According to the music study, such an individual may appreciate music from the Pop, Urban, Elite, and Rock categories. Wanderers have the potential to enjoy it all.

Perhaps it is not a coincidence, then, that the platforming genre features some of the most musically eclectic soundtracks in the history of video games. From the retro 8-bit synths of *Fez*, to the bubbly and jazzy tunes of *Rayman Origins*, to the thumping dance rhythms of *Bionic Commando: Rearmed,* to the gritty rock of *Outland*, platformers have something to offer from every musical genre. I had first-hand experience in this diversity during music composition for one of my own platformer projects, *LittleBigPlanet 2*, which featured everything from big-band jazz to baroque counterpoint to gothic rock. Creating tracks for a platformer offers a game composer many opportunities to artistically stretch and try new things.

Adventure

The adventure game has a long and celebrated history. The genre began with a series of text-based games that allowed players to explore imaginary worlds by virtue of expressive prose descriptions and an interface that recognized the player's typed commands such as "open door" and "kill dragon." These were eventually replaced with graphical representations of those worlds, beginning with static images that were eventually substituted with interactive environments through which the player could roam freely. At the height of the genre's popularity, the adventure game *Myst* set the record for bestselling game of all time. However, the adventure game genre declined thereafter, and no longer occupies a significant portion of the marketplace in its original, pure form.

Nowadays, we are more likely to encounter hybrid "action-adventure" games than pure adventures. In their original state, adventure games focused on environmental exploration, puzzle solving, and the furtherance of a compelling narrative. The action-adventure hybrid includes all those things, but also requires the player to employ sharp reflexes in response to diverse circumstances that might include combat, platform-like navigation, and sudden requirements to execute fast button combinations to unlock desired outcomes. Even with these additions, the heart and soul of the original adventure game lives on in its new form, allowing players the opportunity to participate in an epic storyline, personify a compelling character, and complete a fascinating quest.

According to the DGD1 model, the player type that is most strongly drawn to this game genre is the Manager. This player type enjoys the challenge of mastering the skills necessary for solving the game's many puzzles, and the slightly slower pace of these games tends to agree with the Manager's intellectual mindset. Comparing the MBTI personality attributes of the Manager with the results of the music preferences study, we can see that the Manager

—a logical introvert who avoids long-term plans and enjoys conflict—may be likely to prefer the Rock and Elite music categories. In fact, the Manager would share these same preferences with the Conqueror player type. With this in mind, we may expect adventure games to incorporate rock, elite, or a combination of both styles. However, in listening to the music prevalent in modern adventure games, we will notice a prevailing dominance of "Elite" orchestral music in this game genre. In fact, adventure games would appear to be a true showcase for a dramatic orchestral approach.

From the elaborate orchestral styles found in such games as *Uncharted: Golden Abyss*, *Darksiders*, and *Heavy Rain*, we may draw the conclusion that the Elite genre could be considered the de facto standard for action-adventure games. One of my own action-adventure projects, *God of War*, stayed true to the Elite orchestral approach that exemplifies most games in this category. Yet there *are* examples of action-adventure games that also feature rock elements in their scores. The driving rhythms and guitars found in such games as *Batman: Arkham City* and *InFAMOUS 2* show us that rock has a place in this game genre. In the score I composed for *The Da Vinci Code* adventure game, many of the action-oriented tracks combined an orchestral arrangement with rock rhythms, serving to both emphasize momentum and enhance the contemporary nature of the setting. Such composition choices fit well within the results of the music preferences study, and have in the past been welcomed by the player base of both pure adventures and hybrid action-adventure games.

Role-Playing

A discussion of the music of RPGs can be a fascinating look at how cultural differences can influence musical choices. For the purposes of exploring the musical styles prevalent in the role-playing genre, we need to divide the category into two subcategories: RPGs developed in the west (Europe and America), and RPGs developed in Northeast Asia (Japan and South Korea).

Generally speaking, role-playing games allow a player to personify either a single character or a group of characters, the group members having been charged with fulfilling an important world-spanning quest. Within the course of pursuing that quest, the player may take on many additional side missions and objectives, while improving the adventuring characters by "leveling up" their abilities and equipment. This improvement of statistical attributes is a defining characteristic of the role-playing genre.

Here is where the RPGs of Europe and America diverge from those of Northeast Asia. In the western RPG, the environments tend to be darkly atmospheric and the player tends to be free to go anywhere without becoming constricted by the demands of the linear storyline. For Northeast Asian RPGs, the opposite is the case—these games display a brighter and more colorful atmosphere and the storyline often restricts the player from going anywhere, directing the path of the characters toward locations that will figure in the advancement of the plot. These differences, according to the DGD1 model, have a strong influence on the target market for Western and Eastern RPGs.

Both Western and Eastern RPGs draw the Conqueror, who enjoys the challenge of completing all the game's objectives and also tends to prefer Elite and Rock musical styles. But the Western RPG will additionally attract the Manager, who enjoys the puzzle-oriented play, while the Eastern RPG will have added appeal to the Participant, who sympathizes with the characters and enjoys working with them to achieve objectives.

It may be for this reason that in Western RPGs, we so often find the music that both Conquerors and Managers appreciate: thunderous orchestral scores (*The Elder Scrolls: Skyrim*, *Kingdoms of Amalur: Reckoning*) sometimes punctuated by a few rock elements (*Diablo III*). As a contrast, RPGs of Northeast Asia will alternate orchestral and rock tracks with such styles as techno (*The World Ends with You*), light retro-pop (*Xenoblade Chronicles*), and Top-40 style ballads (*Nier*). While it is clear that both Western and Eastern RPGs are featuring music that appeals strongly to their primary audience of Conquerors, the Eastern RPGs have put forward musical styles that the more musically eclectic Participants may also appreciate.

Survival Horror

The name of this game genre tells us a lot about it. In a survival horror game, our primary goal is to survive while being stalked by unspeakable horrors. Survival may at times be made difficult by virtue of a scarcity of resources. We may have a gun but only a tiny collection of bullets. Sometimes, we have no weapons at all, and must quickly hide or run away when enemies are encountered. This sense of personal vulnerability combines with an intensely oppressive atmosphere, the result of which can be a very frightening player experience.

The DGD1 player type that most enjoys this variety of game is the Wanderer, who appreciates it for the intense

emotional experience and the ability to explore and discover new places. As we've discussed, Wanderer players may be open-minded about many musical genres, and may enjoy music from the Rock, Urban, Pop/Dance, and Elite categories. However, considering the repressively terrifying atmosphere that these games seek to create, the musical styles most likely to be encountered in games of this type are orchestral Elite and Rock (especially in its aggressive Metal subgenre). Nevertheless, some survival horror games have sprinkled other genres into the mix, including some Urban beats (*Silent Hill: Shattered Memories*) and some funky Urban bass lines (*Deadly Premonition*).

Racing

Before we begin exploring this topic, I'd like to relate a personal story that I think may shed a little light on the process of adapting one's musical style to fit a game genre. The story happens to center on racing games and their long history and strong musical traditions. In the autumn of 2007, I read an online press release from Warner Brothers Interactive announcing that they were planning to publish a game based on the upcoming *Speed Racer* film (which would star Emile Hirsch, Susan Sarandon, John Goodman, and Christina Ricci). I'd never written music for a racing game before, but at that point I'd written music for three movie tie-in games, so I thought I should drop the developers a note and ask if they'd consider me for the job. In the note I included links to three tracks of demo music, which I'd been using as general examples of my work and the capabilities of my studio. Since I'd never scored a racing game before, none of these tracks were right for the job, which is what one of the producers of the game told me when he responded to my e-mail. However, he liked my sound and gave me a chance to create a custom demo track for the project. He also referred me to some racing game music examples that I could consult for reference.

This was the first time that I'd really studied the music of racing games in-depth. The process of writing that first demo track for *Speed Racer* turned into a real education for me. Racing games are typified by a driving brand of techno dance music that perfectly suits their sense of speed. Futuristic and at times psychedelic synths meld with hard kick and snare, grungy rhythm guitar, angry vocals, and thrashing rhythm loops, all combining to create a loud, unstoppable momentum. This musical style perfectly suited the racing game genre in 2007, dominated as it was by realistically portrayed aggressive road racing (*Need for Speed: Hot Pursuit*), cartoonish racing with an attitude (*Sonic Riders*), and antigravity racing in the distant future (*WipEout PULSE*).

The *Speed Racer* game did not entirely fit into any of those categories. Yes, it would have high-tech elements reminiscent of a futuristic racer, but its visual style would also feature retro details that harkened back to the 1950s and 1960s, the time period in which the original *Speed Racer* graphic novels and cartoon series were created. In addition, the game would attempt to further the story from the forthcoming movie, so the score would need to have the emotional qualities necessary to support such a narrative. With all this in mind, I carefully composed a sixty-second demo that wove together all these disparate elements into a musical track that was high energy and determined, yet also funky and eccentric. This track landed me the job of composing music for the *Speed Racer* game.

According to DGD1, racing games have a very strong appeal to casual gamers of nearly every type (except for the Casual Participant). Comparing this wide breadth of personality types with the results of the music preferences study, we find that there would theoretically be a broader range of musical styles to choose from than what may be suggested by the techno tradition of the racing game genre. Casual Conquerors and Casual Managers would both seem to have a strong preference for rock, whereas Casual Wanderers may be more open to all musical styles.

All this may lead us to imagine that a strictly rock-oriented score would be a viable choice, but history here will show us that just because the audience may possibly be open to a different musical approach doesn't mean that it would be wise to ignore the musical tradition of the genre. In this regard, racing games bear a similarity to the survival horror genre, which leans heavily toward atmospheric orchestral music (despite the players' possible openness to other musical styles). While working on *Speed Racer*, I knew that there was a strong tradition of edgy electronica music in racing games and that if I didn't incorporate those techno, thrashing, hardcore synthetic elements, I would disappoint racing game fans. That was the last thing I wanted to do, so I studied what had been done before and adapted that style into the retro-futuristic music I was writing. While it is beneficial to be aware that racing game players may be open to a bit of musical experimentation, we should also make sure to give them the experience they really want.

Simulations and Life Sims

When a game invites its players to monitor activities and issue commands to a tribe, a civilization, or an entire world,

then we can call it a *simulation* game. Likewise, if a game attempts to imitate the behavior of autonomous living individuals that the player can guide or influence, then we can call it a *life simulation* game (or life sim). Both game types present a facsimile of real events, whether they are based on our own reality or a fictional world that has been carefully constructed to encourage a suspension of disbelief. However, these two game types feature very different gameplay mechanics, and this has a significant impact in terms of target markets.

In a simulation game, the player usually takes on the role of an omniscient overseer, able to issue orders and keep track of many variables across a large playing field. This overseer character may take the form of a political leader or faction (*Majesty 2*, *Anno 2070*), a business manager (*Airline Tycoon 2*, *A-Train 9*), or even an all-powerful deity (*From Dust*, *Black & White 2*). According to the DGD1 model, the player type most likely to be enticed by this type of game is the Manager, and as we've previously discussed, Managers tend to also be attracted to the music genres of Rock and Elite. Most simulation games feature the styles of Rock, "Elite" orchestral, or some combination of the two, which caters very well to the musical preferences of this player type.

For fans of the life simulation genre, the musical experience is apt to be quite different. Life simulations often cast the player in the role of an all-powerful overseer, much like other simulation games. However, in the life simulation game, goals tend to be more intimate and personal. The player may be tasked with protecting the welfare of individual humans (*The Sims*), aliens (*Spore*), or animals (*Viva Piñata, Animal Crossing*). Often this protection includes the maintenance of physical and emotional happiness, including assistance in achieving goals and avoiding unpleasant experiences. The DGD1 model of player personality indicates that the type of player most strongly attracted to a life simulation game will be the Participant. Participant players tend to be very people-oriented. They like playing games as a form of social interaction, and they also like games that are rooted in heart-felt emotions from sympathetic characters. When we compare the traits typically shown by Participant players—extroverted planners who like to complete tasks and who are motivated by a concern for the feelings of others—to the results of the music preferences study, we can see that Participants, like Wanderers, may enjoy an eclectic variety of musical styles. However, unlike Wanderers, Participants don't have the potential to enjoy *everything*. The Rock category, with its emphasis on introversion, may not sit well with the Participant player type. However, a Participant may enjoy music from the genres of Urban, Pop/Dance, and Elite.

The soundtracks of life simulation games feature lots of musical variety, with an emphasis on a friendly, positive energy. One of my own projects, *SimAnimals* from Electronic Arts, was a life simulation game, and for that project I chose to create a delicately rhythmic orchestral score that emphasized the sociable, light-hearted emotional undercurrent that is often found in these games. As such, this score fit in well with others in the life simulation genre, from the whimsical orchestral tracks of *Viva Piñata,* to the dreamlike textures of *Spore,* to the easy-going pop rhythms of *Animal Crossing* and *The Sims*. These games and others like them offer lots for the Participant player to enjoy, with the rock music genre making almost no appearances.

Strategy

Like a more complex and devious form of chess, the strategy video game provides the player with a rigorous test of mental prowess. In a strategy game, the player is provided with an initial band of followers (usually called "units") that will obey commands involving the building of structures, gathering of resources, generation of additional units, and engagement in skirmishes to eliminate threats. Within this gameplay framework, the player may be required to build an entire empire (*Civilization*) or crush an enemy nation (*Command & Conquer, Supreme Commander*). Strategy video games have their historical origins in the tabletop war games developed by famed game company Avalon Hill.

With a genre as cerebral as the strategy game, we would be right in assuming that its most strongly associated DGD1 player type would be the Manager. This player type finds great enjoyment in mastering the complex and subtle systems of rules that are imposed by the strategy genre. As we've previously discussed, the results of the music preferences study suggest that the Manager would derive the most satisfaction from either a Rock or Elite musical score . . . and that is what this game genre has usually provided. From the apocalyptic orchestral and choral grandeur of *Might and Magic Heroes VI* to the driving rock rhythms and agitated strings of *Supreme Commander 2*, the music of strategy games has settled comfortably into the preferred musical tastes of Manager players.

Puzzle

Many games include puzzles as one of the challenging obstacles that stand in the way of the player's true objective, but in the pure puzzle game, there is no other objective. The brain-teasing pleasure of the puzzle is the sole reason for playing the game, and the creativity and devious difficulty of the puzzle provide plentiful entertainment value of

their own. Some puzzle games can reach the level of abstract art in their presentation, taking players into a keenly focused state of altered consciousness as they mentally wrestle with the conundrum before them.

Tetris—that game of slowly falling blocks—was the first to widely popularize puzzles in their video game form. Other notable puzzle games followed, including the highly successful *Lemmings* franchise, in which the player valiantly struggles to save hoards of those poor little creatures with their legendary penchant for self-destruction. Other popular puzzle games include *Minesweeper*, *Bejeweled*, *Lumines*, *Echochrome*, and the *Loco Roco* franchise. The puzzle game genre may also include such subgenres as *Rhythm/Dance,* in which the player must match patterns on the screen by either pressing controller buttons or performing dance-like moves on a controller mat (*Dance Dance Revolution*); *Party Games*, in which players engage in a variety of different puzzle types for the purposes of light-hearted multiplayer (*Rayman Raving Rabbids*); and *Adventure/Puzzle*, in which the player explores interesting environments in order to uncover and solve intriguing puzzles (*Catherine*, *Myst*).

Bateman and Boon's DGD1 model indicates that puzzle games may be enjoyed by a wide variety of player types, including Managers, Wanderers, and Participants. Only Conquerors find little to relish in puzzle games, except when they are competitive trivia games (which appeal to a Conqueror's desire to be triumphant). Consulting the results of the music preferences study, we find that players of puzzle games may enjoy a large variety of musical styles. In fact, the puzzle genre displays a highly varied assortment of musical genres, from the dark electronica of *Portal 2*, to the adorably cute chipmunk-voiced pop tunes of the *Loco Roco* franchise, to the elegant chamber strings of *Echochrome* and the easy-going jazz and R&B of *Catherine*.

Fighting

Perhaps the most controversial of all video game genres, fighting games hold the distinction of being the first in the history of the medium to merit a parental warning label. Yet despite all the gory displays, decapitations, and disembowelments, the fighting game remains at its heart a test of memory, reflexes, and sheer determination. The successful fighting game player will doggedly learn every button combination and study the moves of every opponent. A fighting game is not usually concerned with giving the player an extensive narrative or many opportunities for exploration. In a fighting game, there is only one goal, and that is to utterly annihilate all rivals. Despite the complexity of their control scheme, fighting games feature essentially simple objectives. In a one-on-one fighting game, such as *Dead or Alive 5*, two combatants enter an arena and then one combatant pummels the other into submission. In a "beat-em-up" fighting game, such as *Anarchy Reigns*, the player punches and pounds endless waves of enemies while advancing from one setting to another.

According to the DGD1 model, fighting games have the strongest appeal to one player type only—the Hardcore Conqueror. This player derives great satisfaction from "beating" the game, and the fighting genre provides enough challenge to make the achievement of each triumph a tremendously satisfying experience. While the steep difficulty may sometimes prove too discouraging, Casual Conquerors have also been known to enjoy fighting games, although not with the same fervor as their Hardcore counterparts.

When we compare the personality characteristics of Conquerors with the music preferences study, we find that Hardcore Conquerors show a potential to enjoy both Elite and Rock music, while Casual Conquerors may enjoy only Rock. Perhaps in the unconscious effort to keep both its Casual and Hardcore fans engaged, the musical scores of fighting games have embraced all the subgenres of rock. From the raucous speed metal of *Dragon Ball Z: Ultimate Tenkaichi*, to the industrial rock of *Mortal Kombat 9*, to the hardcore rock of *Marvel vs. Capcom 3: Fate of Two Worlds*, rock music is very well represented in the fighting genre. Orchestral Elite music makes occasional appearances in games such as *Soul Calibur V* and *Shrek the Third*, one of my own projects. Falling firmly in the subcategory of a "beat-em-up," *Shrek the Third* allows players to plow down waves of enemies while wandering through a fairytale world (which clearly demanded a traditionally orchestral approach). In this case, the fantasy-sweetness of the orchestral score serves as a contrast to the slapstick action of the gameplay.

Stealth

This game type shares two common characteristics with survival horror. In both genres, the setting tends to be rich with a dark and suspenseful atmosphere. Also, in both game types it is often imperative for the main character to hide from or avoid enemies. However, in the stealth game, the player may choose to hide only long enough to maximize the chances of effectively attacking the target once the perfect conditions for that stealth attack have been reached. Often, the main character in a stealth game is an essentially sneaky individual such as a spy, a thief, or an assassin.

Having created music for a game that falls into the stealth category (*Assassin's Creed III: Liberation*), I can attest to the importance of composing the score with the intent of reinforcing a pervasive ambience of apprehension and tightly controlled aggression. For the main character of a stealth game, there is always the danger of discovery, which can spoil many well-wrought plans and place the main character in mortal peril. Whether the game takes place in some futuristic dystopia (*Deus Ex: Human Revolution*), in a contemporary setting (*Splinter Cell: Conviction*), or in the distant past (*Assassin's Creed: Revelations*), stealth games rely on their sense of atmosphere to amplify the covert nature of the gameplay.

There are very few games that can be called *purely* stealth games, as most also incorporate gameplay mechanics from other genres (such as those of a shooter or an action adventure). However, the stealth element makes such a strong and distinctive contribution to the overall aesthetic and mechanics of a game that its presence may change the game's strongest associated DGD1 player type. According to this model, pure stealth games appeal most strongly to Hardcore Conqueror players, with Casual Conquerors finding only a limited appeal in the genre. The results of the music preferences study indicate that we may expect to find the musical styles of Rock, Elite, or a combination of both in a stealth game's musical score. When looking at the music featured in modern stealth games, this assumption tends to be supported. We find these two genres represented in the moody orchestral and synth combinations in *Deus Ex: Human Revolution*, the rock-inspired beats and epic orchestral action of *Splinter Cell: Conviction*, and the mournful and minimal orchestral score of *Assassin's Creed: Revelations*, as well as in the scores of many other games. Overall, the music of a stealth game seems to convey a sense of dark and determined suspense, which is in keeping with the nature of stealth gameplay.

Conclusion

Musical genres have strong demographic correlations, helping developers tune in to their target markets and appeal to them on multiple levels. While the results of musical preference and personality studies should never dictate to us what our musical choices should be, they may help us to appreciate why a game developer asks us to write music in a particular style. The studies may also help us to understand why some game genres have featured one particular musical genre so prominently and consistently, year after year.

Player personalities can never be considered static, nor can genre divisions and traits of music ever be chiseled in stone. It is helpful, though, to have these scholarly insights on hand as we contemplate the vast array of musical choices we routinely make as composers for games.

6

Roles and Functions of Music in Games

At this point, let's pause and contemplate a simple but obvious question: why do video games *have* music? A musical score is certainly not a requirement. And yet most games have a lot of music. Why? I'd suggest that it may be for the same reason that so many other parts of our daily lives have music.

When we think about it, we can put together a fairly long list of ordinary places where we're likely to find music on a daily basis. These include overt performances meant to deliver music directly to an audience (concerts, sporting events, radio playlists), indirect music performances designed to support other forms of entertainment (television programs, TV/radio ads, films, video games), and subtle music used in public locations (clothing shops, restaurants, grocery stores, waiting rooms, elevators, airports, etc).

In truth, we're likely to find music almost everywhere we go. Music is the way in which human beings communicate to each other without employing words or symbols. When we walk into a restaurant and we hear some cool jazz, we know that this is the restaurant's way of subconsciously urging us to relax, settle in, and stay awhile. When we walk into a sporting event and we hear a rock anthem, we know that the venue is hoping we'll get worked up about our teams, buy foam fingers and chili dogs, and cheer our brains out.

As creators of music, we are communicators of wordless messages that will inevitably be used for a variety of purposes. Sometimes our messages are blatant, like a bubblegum pop track in a clothing store declaring in no uncertain terms, "Hey tweens! This store is for *you!*" Sometimes our messages are almost subliminal, like the barely perceptible lite music in the doctor's office meant to keep the patients from raising a riot over how long they've been waiting.

Read any book about writing music, and we'll inevitably hear the long-held truism, "Music makes you feel." Yes, musical underscore conveys emotion, but that's not the only role that music plays. As composers for media, our music must accomplish a wide variety of tasks. These tasks are even more complex for video game composers. In this chapter, let's discuss various roles and tasks that music can perform in the structure of a video game. In this discussion, I'll offer my personal experiences from my own projects, and I'll also examine the music of other games that can serve as helpful examples of the functions of music within works of interactive entertainment.

Music as a State of Mind

Certain games require a specific mindset in order to play them effectively. Call it the *zone*. While all games can inspire their players to concentrate until they've attained that sensation of perfect focus otherwise known as the zone, I've found that there are certain game types that demand an altered mental state right from the start. As creators of music for games, we can help the player get into that state through the medium of our art.

Let's discuss some of the game types that benefit strongly from the zone:

- Real-time strategy
- Simulation
- Puzzle
- Survival horror

When playing a real-time strategy game, the player needs to be aware of many unfolding processes occurring in a large-scale arena, and that awareness can feel both hyper-alert and ultra-calm at the same time. Unlike a traditional strategy game (wherein the players are afforded as much time as they like between "turns" to make decisions), in

real-time strategy the game world keeps progressing regardless of whether the players have reacted or not. Simulation games also share many of the same issues as real-time strategy, in that events in the game continue to progress without regard for the speed of the player's actions. In addition, many types of puzzle games call for a vivid awareness of either the minute details of the environment or of a playing field that is constantly changing because of unfolding events. This mental state might be focused on smaller-scale events requiring either careful inspection or frequent corrections and changes in play strategy. Finally, survival horror games benefit from the fostering of a hyper-alert mental state, although the reasons why this state is so beneficial differ sharply from those associated with real-time strategy, simulation, or puzzle (more on this later).

Music can serve an important role by simulating the state of mind required to be in the zone. To accomplish this, we need to ponder what makes that mental state unique and identifiable, and what musical techniques would be most evocative of that particular sensation. I believe there can be as many different approaches to accomplishing this as there are composers in the industry, but the overriding principle is a simulated "altered state," and that goal remains constant regardless of the path chosen to reach it.

To illustrate this approach using one of my own projects, let's talk for a moment about the *SimAnimals* game, which falls into the simulation category. In the game, the player is tasked with monitoring and meeting the needs of the natural landscape and the animals living there. During the course of the game, animals come and go, encounter situations that put them in distress, make allies and enemies, and engage in activities that alter the natural environment. At any given time, players may be inundated with alert messages, informing them that new animals have arrived, that certain long-time denizens are in jeopardy, or that a particular area of the environment is suffering from neglect. If these various needs aren't met, eventually the game world will degrade into a dead, unpopulated landscape. However, if the player is nimble enough to meet all the various needs of the environment and its population, then the game world and its animal citizens will blossom and grow until they reach a utopian state of happiness and health.

Like other games of its kind, *SimAnimals* requires a successful player to be constantly aware of the big picture while quickly reacting to each individual small problem that pops up. It was an interesting challenge for me as a composer. At the beginning of the project, the developers and I discussed possible music styles. Early on, we were focused mostly on the mood of the game. We discussed a highly melodic, cinematic approach, imagining that such a musical score would be perfect for the gentle, idyllic landscape and the endearing critters that called it home. I wrote a collection of short cues in a variety of melodic, cinematic styles. None of them worked. The music seemed to sit on top of the game, barely skimming the surface, rather than fitting inside it. At that point I abandoned the cinematic approach and turned to other musical styles until I hit upon post-minimalism, which fit the game perfectly. The developers agreed that this style suited the game very well, and I was free to launch into full-scale music composition for the project.

The purest form of minimalism is a type of musical construction that emphasizes complex arrangements of small repeating phrases. These phrases can be layered with increasing intricacy until feelings of frantic activity and slow, gradual transformation are achieved simultaneously. I liked this style because I saw the parallel with the mental state needed for a player to be successful in *SimAnimals*. I went with post-minimalism because it is a form of minimalism that is a bit less strict in its rules. It allowed me to be more whimsical, in keeping with the art style of the game.

Figure 6.1
An excerpt of percussion parts from the *SimAnimals'* track entitled "Absolutely Positive."

In describing this process of musical experimentation and elimination in *SimAnimals,* I don't mean to suggest that one particular subgenre of music should be the only logical choice for a particular category of game but to demonstrate how the overriding mental state of a game can assert an influence over a composer's musical choices. Another composer may make completely different choices regarding musical style for a simulation game such as *SimAnimals*, and there's nothing wrong with that. Every game has its own particular mood, and a game's music needs should be evaluated on a case-by-case basis. Likewise, every composer has unique strengths, and those are

of paramount importance in considering what musical approach to take.

As another example, Jerry Martin's musical score for Electronic Arts' *SimCity 3000* simulation game evokes that altered mental state we've been discussing. Using an orchestral sound palette, the score is driven by overlapping ostinatos with a persistent sense of momentum. Conveying both activity and constancy, the music often seems to move ahead and stand still at the same time. This musical approach helps to support the altered state by mirroring the hyper-alert and ultra-calm nature of players' mental activity while they make decisions and react to dilemmas. Likewise, in Rich Vreeland's soundtrack for the puzzle game *Fez* from Polytron Corporation, shimmering electronic tones create hypnotic patterns, sometimes with stark simplicity. The trance-like atmosphere evoked by this compositional technique has the potential to enhance the concentration of players and increase their enjoyment of the game. As a contrast, Frank Klepacki's soundtrack for the *Dune 2000* real-time strategy game from Westwood Studios is characterized by insistently recurring chord progressions and militaristic rhythms that convey urgency while avoiding melody and ornamentation. The result is a much heavier musical texture than the previous examples, yet the score still conveys that combination of energy and composure that typifies the zone mental state.

I should mention that there is another specific state of mind that music can readily accomplish, and that is the hyperawareness necessary for the enjoyment of a good survival horror game. As we discussed in the previous chapter, survival horror requires the player to stay alive while wandering through grim environments populated by nasty creatures (which are often hidden in unexpected places and ready to jump out at a moment's notice). This inspires a mental state that is unique to the survival horror genre, and which is hard to describe. Call it a state of edgy alertness, although perhaps that phrase doesn't quite capture the feeling completely. For instance, in Akira Yamaoka's soundtrack for *Silent Hill 4: The Room* from Konami, much of the music can be described as eerie, disturbing atmospheric textures set against gritty drum patterns. Without any shocking or explosive moments, this music seems to make no effort to scare the player outright. Rather, it strives to set the player on edge by presenting a sharp contrast between a floating, creeping stillness and a grim, relentless motion.

The zone state for a survival horror game isn't about fear. The player shouldn't be afraid all the time or those special moments of genuine terror will lose their impact. An effective survival horror game can literally make a player scream in terror, and yet gamers shriek not only because the monsters are hideous, but also because the whole game encourages that aforementioned state of edgy alertness. We may compare this mental state to the classic fight-or-flight reaction, which is neither angry nor fearful. Eventually the game will sharpen this state of mind into such a keen edge that when the monstrosities actually appear, the gamer is primed to emotionally explode. As composers, we should do everything in our power to reflect and encourage that altered state of mind, using whatever techniques will best accomplish the task.

Music as a World Builder

Games have the marvelous ability to transport us to fantastic landscapes of the imagination. Artists and designers combine their passions to produce fully realized worlds, with histories and distinct cultures that provide the player with hours and hours of delighted exploration. While all game designers strive to create convincing worlds for us to inhabit and discover, certain game types are structured around that exploration, making the richness of the environment a vitally important element to the core effectiveness of the game. As composers, our job in these types of games is to support and enhance the realism of the world and the depth of its culture, allowing the players to become fully immersed as they investigate and experiment with the environment. So let's discuss some of the game genres that benefit most from this musical approach:

- Role-playing games (RPGs)

- Massively multiplayer role-playing games (MMORPGs)

- Adventure games

As we've discussed, RPGs place heavy emphasis on exploration of a rich and culturally diverse world. The games typically offer multiple ways in which players can learn about the past of the world they are inhabiting, including clues in the environment, conversations with non-player characters, and information resources that are typical of the setting (ancient scrolls, books, newspapers, data terminals, etc). MMORPGs offer similar elements to RPGs while allowing players to go online and interact with each other, band together to tackle enemies and quests as a team, or fight against each other in massive battles. Like RPGs and MMORPGs, adventure games provide lots of opportunities for players to wander and make discoveries about the world they're inhabiting, but adventure games

place stress on puzzle-solving as a means to progress and overcome obstacles.

As a composer for an RPG or an MMORPG, the primary focus should be the enhancement of the world that has been created by the development team. All the components of an RPG are structured to encourage the player to get out into the world and interact with it, learning about the people and culture while simultaneously advancing a compelling storyline through successful combat and the completion of quests. The music should surround the player with aural details about the intrinsic nature of the setting in which the game takes place. In essence, the music should serve as a world builder, joining forces with all the other elements of game design, visual artistry, and storytelling to complete the sensation of full immersion in the role-playing experience.

The Witcher series of games from Atari are a good example of this style of game music composition. The games are set in an ancient fantasy world populated by elves, dwarves, and other mythical creatures. To support the setting and lend it authenticity, composers Pawel Blaszczak and Adam Skorupa employed iconic Celtic instrumentation such as harps and bagpipes. These instruments were combined with hand percussion, guitars, and other plucked strings to help create a mental image of an agrarian society lost in the mists of time. The music serves a vital function in enhancing players' acceptance of the game world and their involvement with its characters.

In preparing to create music that feels grounded in a game's setting, research can play a crucial role. Just as the game designers and artists are researching the relevant topics that relate directly to their fictional world, the game composer should also become familiar with these resources. Though researching musical styles is helpful, it should not be the beginning and end of a composer's investigation. There is tremendous benefit in learning the details of the game world and exploring the real-world influences that went into its development. The choices we make as composers are not based solely on musical considerations but can also be strongly dependent on how we emotionally relate to the project we're working on. The more knowledgeable we are, the more personally invested we become in the project, and this makes the music we write feel more directly connected to the game world. Plus, knowledge of the details that inspired the game designers can also inspire the composer to make choices with instrumentation and technique, potentially connecting the music more strongly to the culture that informs the storyline and shapes the personalities of its characters.

In addition to RPGs, the adventure game is a genre that depends heavily on the fascinating richness of its environment. Like an RPG or MMORPG, an adventure game traditionally focuses on story and setting. Composers for adventure games can view themselves as partners with the designers, artists, and writers in the effort to deepen the convincing nature of the locations in which the game is set. Consulting the appropriate resources and applying diligent research to the game setting, the composer can create music that feels directly relevant to the culture of the game's fictional world.

When I was hired to create music for *The Da Vinci Code* video game, I knew there would be research involved. For those of us who have not heard of this worldwide phenomenon, *The Da Vinci Code* is a bestselling novel. Written by Dan Brown, the novel concerns itself with the Knights Templar, the Catholic Church, and a mysterious organization called the Priory of Scion. Published by 2K Games, *The Da Vinci Code* video game is designed to explore these historical details in depth. It occupies the adventure game genre, with the addition of some very light combat elements.

Considering that the story includes strong religious images and themes, I focused my music research on liturgical compositions. The game would take place in a great number of famous churches and religious sites. It seemed clear to me that if the music didn't directly pay homage to the long musical history of the Catholic Church, it would feel dreadfully out of place. To prepare for the project, I read the novel by Dan Brown and found abundant inspiration there. Although the novel provided me with lots of historical detail, I went on to consult resources on the works of Leonardo da Vinci because his life and paintings figure prominently in the story. The game would include complex puzzles whose mechanics were intrinsically linked to religious and historical imagery. Doing this research made me feel more comfortable with those elements, which in turn allowed me to reflect them in my own compositions. In the later stages of my research phase, I hired a Latin translator. Knowing that I would be writing several liturgical choral compositions, I prepared a comprehensive set of lyrics to be translated into Latin. Infusing my work with the spirit of the source material helped the setting feel more believable and compelling.

The preceding example was of a project that featured a real-world historical backstory. This doesn't preclude conducting research for a more purely fantastical project. Most (if not all) fantasy worlds derive inspiration from the real world. Science fiction settings owe a debt of gratitude to a long line of serious-minded futurists who have speculated on the nature of human development in numerous published works. Traditional sword-and-sorcery fantasy is richly influenced by the myths and legends of ancient cultures. I find it very comforting to know that,

regardless of the project, I'll always be able to find inspiration through research.

It's a lot of fun working on projects in which the music serves to help build the world. Going far beyond setting the mood, the music gives the impression that it was born right out of the game, as though some non-player character wandering around in the background may have created it. If the music is this well integrated into the setting, we as composers can feel very satisfied that we've done our job.

Music as a Pace Setter

Certain game genres live and die by the level of excitement they create. Part of the experience of playing a game like this is feeling your pulse rise. These games, known collectively as action games, tend to be "twitchy." They rely on quick reactions that resemble involuntary twitches (hence the name). Manual dexterity is a must. The games serve as a rigorous test of the agility and musculature of the human hand and the keenness of the human nervous system. Examples of action game genres include:

- Fighting

- Racing

- Action-Adventure

Shooters also fall into the category of action games, but for the composer there are unique considerations for shooters. I'll discuss this in more detail later on in the chapter.

Music in an action game should reflect the pacing and energy level of the gameplay. However, music can also serve the dual function of augmenting that sense of pace, subtly nudging it in the desired direction. Twitch games such as fighters consist of lots of quick actions that can at times feel choppy, with pauses occurring between actions that have the potential to drag down the momentum. Racing games have periods of relative inactivity (such as when the car is alone on the track, or the player is driving down a less challenging section of the raceway), and these can also create a dip in the overall excitement level. Action-adventure games sometimes have short breaks during combat sequences in which the player has defeated a first wave of enemies but has not yet engaged the remaining foes. These lulls are deadly in a game whose primary draw is adrenaline.

As composers, we can remedy this problem by infusing the game with an overall momentum. This momentum should link the highest-energy parts of the gameplay to each other, boosting the lower-energy segments so that the whole experience feels more unified. In order to do this most effectively, the pacing of the music should share a common core with the pacing of the gameplay.

There are many ways to accomplish this. I like to watch videos of gameplay taken from the project I'm scoring. While watching, I pay close attention to any rhythmic happenings onscreen. In doing this, I'm certainly not trying to sync the characters to the tempo of my music. Even if this were possible, it would make the characters look like they were dancing in time (which might be desirable for a humorous project, but would be very undesirable for a serious one). What I'm trying to do is create a rhythmic construct that shares a common pace with the overall rhythm of events in the game. When done correctly, this technique allows the music to meld with the actions of the player, feeling very natural during gameplay. When lulls occur, the music creates a sense that the figurative wheel is still spinning. The machinery of the action is still at work. In other words, the music says to the player, "Keep alert! It's not over yet!"

For example, when I began composing the music for the video game *Speed Racer* from Warner Bros. Interactive Entertainment, I kept in mind that one of the main draws of the game is the ability to race at over 400 miles per hour. The game environment and physics does everything in its power to make the player perceive that speed, but it is difficult to mentally encompass 400 mph. In reality, we only truly feel the intensity of the speed at which we're driving when we have to suddenly hit the brakes hard, or if we are involved in a crash. Driving smoothly along, our minds and bodies adjust to the speed until we register it comfortably. In an action game, we don't want the player to feel comfortably adjusted.

The *Speed Racer* game incorporates something called 'Car-Fu,' in which cars can perform combat-like maneuvers against each other in slow motion. During these brief sequences the race will grind to a near halt, and the subsequent acceleration back to normal time serves as a reinforcement of the sense of speed. During normal racing, however, the game has built-in assistance to prevent the player from running off the track, and it is unlikely for the player to suddenly hit the brakes hard. I knew that there was a potential for the player to mentally adjust to

the speed during regular racing sequences and cease to feel excited by the racing itself.

When I started preparing to write music for this project, I had already decided that my primary goal would be to communicate dizzying speed to the player. This goal had to be approached carefully. Simply writing fast music wouldn't be enough. In time, a person's senses become numbed to fast tempos, and they no longer seem particularly exciting. Like the Car-Fu segments that provide big speed contrasts in the game, I would need big speed contrasts in the music. My experiments with frantic rhythms set against slow harmonic lines seemed to work well when watching the gameplay videos. The slow elements of the music served to make the fast elements feel even zippier. I also incorporated some sound design within the music, such as whooshing sounds with dramatic Doppler effects, to reinforce the perception of speed. Further, keeping the music in a state of flux with rapidly changing textures and instrumentation proved to be an effective approach. Contrast is one of our most powerful tools as composers. It gives every musical device and technique more impact.

In a fighting game, our rhythmic inspiration may be derived from the idle animations of the fighters between attacks, or the built-in gaps between actions that occur when a particular take-down is activated, or the flurry of movement when two experienced players attack each other. Likewise, in an action-adventure game our rhythmic inspiration may derive from many of the same gameplay components, with the added consideration of progression through a complex level rather than confined combat within an arena setting. In the *Prototype* action-adventure game from Activision, Cris Velasco and Sacha Dikiciyan scored the fighting sequences with a hefty combination of dark orchestra and synth, emphasizing the main character's tendency to land devastating blows rather than engage in thrust-and-parry. They also often used simpler versions of the same action tracks to maintain the momentum between battles, helping to bridge the player from one fight to the next.

Regardless of how we address the pacing of the game, our most important objective will always be to create music that feels integrated with the gameplay experience rather than simply skimming on top of it. We should use whatever composition techniques will most effectively infuse our music with the pacing of the action.

Now I'd like to offer a word about shooters. As an action game, one would think that a shooter would have the same music needs as other game types within the overall genre. Generally speaking, they do. However, since most shooters offer multiplayer modes that take place in a fully three-dimensional setting with enemies appearing from all sides, the ability to pinpoint an attacker by listening to his or her approach becomes very important. Players of shooters don't like anything that interferes with their ability to perform at their best, and this is especially true for competitive online play. A composer for a shooter will often take these issues into consideration when structuring the music for multiplayer modes. A good example of this can be found in Christopher Lennertz's score for the *Starhawk* shooter from Sony Computer Entertainment. During the single-player campaign, driving music keeps the excitement alive. However, this changes radically in multiplayer mode, when music isn't heard unless certain circumstances are triggered, such as when an enemy flag is captured or when a timed match is about to end.

Composers of music for shooters need to be especially careful, remembering that the soundscape around the player is an important part of the gameplay mechanic. In some cases, the most exciting music in shooters may be relegated to dramatic special events that are limited in duration. As composers on shooter games, we may want to save our most dramatic compositions for special occurrences that advance the storyline. These are called *scripted events*, and they share some similarities with *cinematics* (I'll be discussing both of these concepts in more detail in chapter 10). We may also find ourselves creating a lot of exploration music, which is heard between major battles and helps to set the scene (refer to the "Music as a World Builder" section, earlier in this chapter).

Music as an Audience

The *audience* technique of music composition is widely used in video game design. Regardless of the game genre, as composers we will be asked to create tracks that serve as an audience to the actions of the player, although the degree to which we may apply the technique may range from subtle to blunt. Simply put, when we write music that serves as an audience, we are attempting to create the impression that the music is essentially watching the gameplay and commenting periodically on the successes or failures of the player.

A modest application of this approach would be the use of a few music cues that are triggered when a player successfully completes a level/quest/objective, fails to complete the level/quest/objective, or dies. The music would either be congratulating the player on the successful completion of a task or admonishing the player for his or her failure/death. This use of the audience technique is nearly as old as the video game industry itself, was employed in

nearly all of the earliest games, and is readily found in a large percentage of modern video game scores. One of the most amusing uses of this approach was in the 1995 video game *Total Distortion* from Pop Rocket Inc., in which Kent Carmical and Joe Sparks created a full-blown rock song entitled "You Are Dead!" that would greet the player's demise.

As the application of this musical approach becomes more sophisticated, we may be asked to create full-length tracks that reflect the overall status of gameplay, whether successful or not. For *SimAnimals*, I was asked to approach this technique quite literally. The game includes a status bar at the top of the screen which shows how "happy" the game world is at any given moment, and when that status bar reaches specific levels of happiness or misery, a full-length piece of music is triggered. This track serves as an audience for the player's progress because it expresses either joy or despair (in varying levels of intensity) depending directly on how the player is doing.

Taking this method to an even higher level of sophistication, we may be asked to create dynamic/interactive tracks that are constructed of interlocking segments having positive and negative audience reactions built into the format, allowing the game engine or the player actions to directly influence how the music is commenting at any given time. We'll be discussing interactive music in chapters 11 and 12, so we won't go into detail here. As of this writing, interactive techniques constitute the most complex realization of the music-as-audience approach.

Speaking from experience, I can tell you that when we are creating music that comments on the player's successes and failures, we can expect game developers and publishers to be especially invested in the outcome of our work and likely to remain as closely involved in our creative process as possible. These tracks are high stakes because they constitute a powerfully direct method of communicating with the player. In fact, this is one of the only game music types that steps directly into the matrix of the game's core mechanics, providing essential feedback during play.

The music-as-audience method can be used to deliver feedback very gently or it can hit the player over the head with an outrageously exaggerated reaction. In some games, the music may mock the player (as in *Total Distortion*'s "You Are Dead!"). In others, it may offer sad commiseration. Just because this technique dates back to the earliest games does not mean it can't be highly effective in a modern-day game. We should rely on our own sense of musicality to determine how subtly (or blatantly) we use this method.

While we're discussing the concept of music as audience, I'd like to mention a technique that, while not technically falling into this category, nevertheless shares enough in common to be described here. When writing full-length tracks for exploration or combat, it is possible to create the generalized impression that the music is sensitive to the actions of the player and commenting on his or her progress at any given moment. This can be accomplished whether the music is interactive or not but is an especially difficult technique to pull off with a linear, non-interactive track. Essentially, the composer writes a track that alternates between moments of relative success and relative peril, creating a non-interactive musical audience that is continually saying, "You're okay so far . . . oh no, watch out! Whew, that was a close one, now you're fine . . . oh wait, no you're not!" A track like this either works beautifully or fails spectacularly, so we should take care when composing it. Construction revolves around phrases that rise out of each other or fall into each other, expressing alternating moments of tension and release. Ideally, when triggered in the game, the track seems as though it is continuously reacting to the player's progress. The effect is an illusion, but can be a very powerful one. In my experience, a track like this is especially pleasing during combat, which naturally features lots of high and low moments during the course of a typical battle.

A great deal of help in understanding this composition method can be found by studying the recordings of film composers, especially their scores for action sequences. Typically, a movie action sequence features lots of close scrapes and fleeting triumphs. The musical score underlines these events with rhythms and melodies that accentuate the emotion of each moment as it passes. This technique is demonstrated particularly well in the action sequences of the *Indiana Jones* films.

While film composers have the luxury of relying on a set sequence of events to determine the pacing of their musical transitions, we as game composers can never predict the ways in which actions will occur within the course of a game. We can, however, attempt to simulate the same musical effect employed by film composers. I have used this technique in many of my projects. For example, when composing music for *The Legend of the Guardians: The Owls of Ga'Hoole* video game from Warner Bros. Interactive Entertainment, I created tracks of this type for some of the aerial action. The game features warrior owls involved in large-scale battles and frantic chases, so there were plenty of opportunities to put this composition method to use. I placed particular emphasis on this effect during a late-stage chase sequence. Because the stakes were very high at this point of the game's storyline, I wanted the music to feel especially reactive to the action.

Figure 6.2
Piano reduction excerpt of "Attack at Dawn," an orchestral track from the *Legend of the Guardians* video game score.

As another example, Jeremy Soule's soundtrack to the *Supreme Commander* strategy game from THQ makes periodic use of this music composition technique during dramatic battle sequences and in its cataclysmic final mission. With global warfare creating an inferno of carnage on the field of combat, the music creates tension by swinging back and forth between triumph and anxiety, helping to propel gameplay forward.

Additional Roles

Before we conclude the chapter, I'd like to describe two other roles that music can play. These functions have more to do with technical and business concerns than with musical artistry, but are nevertheless important to understand.

Music as Branding

Some games have such distinctive musical scores that a gamer could listen out of context to any given track and know immediately what game it came from. This is desirable for the game developer and publisher because it gives their marketing departments a potent tool. Trailers for such a game could conceivably begin with an abstract, mysterious image and the opening notes of the game's musical theme. That would be all that was needed for the audience to raise a shout of familiarity and excitement.

Such is the power of musical branding. In a trailer like the one described above, the branding takes the form of a motif or melody that is both distinctive and powerfully memorable. To offer a few examples, the *Halo* franchise from Microsoft Studios derives its musical branding from the Gregorian-style melody created by Martin O'Donnell for performance by a male unison choir, and fans of the series can recognize that melody after just a few notes. For the *Warcraft* games from Blizzard Entertainment, the most iconic and recognizable music is the music composition

team's heroic "A Call to Arms" choral anthem, which has appeared in several arrangements across the game's many expansions. And probably the most venerable example of musical branding in the game industry is Koji Kondo's peppy theme for *Super Mario Bros.* from Nintendo.
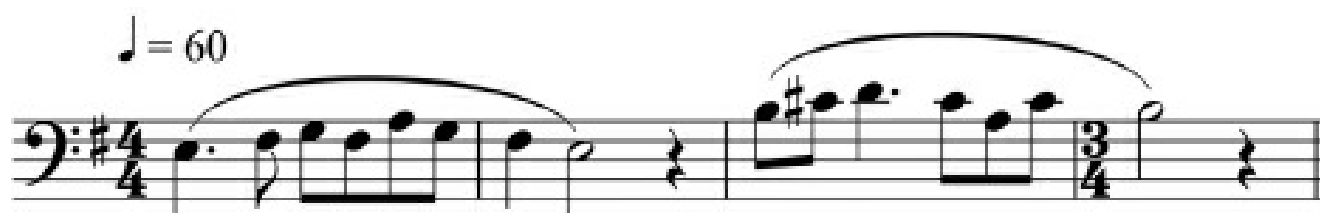
Figure 6.3
Halo theme.
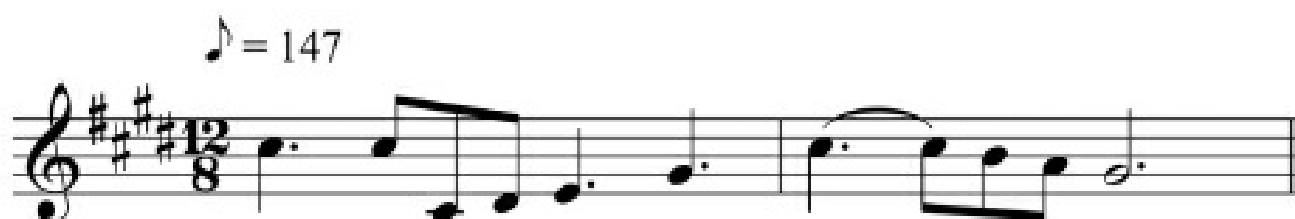
Figure 6.4
Excerpt from the *Warcraft* theme "A Call to Arms."

Figure 6.5
Excerpt from the *Super Mario Bros.* theme.

All these themes are instantly recognizable and identified with their associated video game brand, but theme recognition is not the only way in which music may serve to brand a video game. A highly distinctive musical style can create an atmosphere for a particular game or franchise. Unique scores can serve to strengthen a game's brand identity, even without relying on memorable themes. For instance, in *Patapon* from Sony Computer Entertainment, Kemmei Adachi and Daisuke Miyake created a world-fusion musical style coupled with childlike singing voices for the game's miniature warriors, resulting in a musical soundtrack unlike any other. In the *Bioshock* franchise from 2K Games, the orchestral soundtrack of Garry Schyman is imbued with chaotic unpredictability by virtue of the aleatoric technique (as mentioned in chapter 2, this technique involves the music being written with a degree of chance factored into the composition). This lends the music a characteristic sound that *Bioshock* fans can quickly recognize. Likewise, the music composition team for the *Sims* games from Electronic Arts created a distinctive light-hearted synth pop that is strongly identified with the franchise and distinguishes it from other games.

Writing music to establish a brand is no different from the other goals and functions of music in games. Therefore, it should not be our sole focus when we are creating game scores. It is a foregone conclusion that if we are writing a theme, we want it to be memorable. Likewise, if we are writing atmospheric music, we hope it will be distinctive and evocative. The branding label applies only if the music we create truly excels in these areas. As much as branding may seem like a strictly commercial idea, it is also a testament to some of the most compelling music you'll find in games. When the game developer and publisher begin using our music heavily in their trailers to reinforce the identity of their brand, we can take that as the most sincere compliment we'll receive from the development and publishing team. They consider our music to be an iconic expression of their game.

Music as Demarcation

This function of music in games is about as opposite to the branding idea as possible. When writing this sort of music, the focus is on strongly delineating in-game locations and bluntly outlining the differences between gameplay types, without any particular concern for maintaining the overall musical style or aesthetic. In essence, the music has become a figurative fence, separating things from each other. While it is rare to find an entire game structured this way, sometimes game developers will ask the composer to write tracks that are wildly outside of the overall musical style of the game. These tracks separate some specific gameplay types from the rest of the experience. They could be written for an oddball humorous minigame set inside a very serious action adventure or a sequence of brainy puzzles inside a button-mashing brawler.

As an example, in Nobuo Uematsu's *Final Fantasy VII* soundtrack, the bulk of the music ranges from low-keyed atmosphere to end-of-the-world action, with the exception of some tracks written for one particular series of minigames. Since a minigame is a gameplay mechanic that is dissimilar to other surrounding gameplay activities, it often makes sense to compose music for a minigame that helps further differentiate it from the rest of the game. In the Chocobo races of *Final Fantasy VII*, the player is diverted from the game's epic quest and tasked with riding a giant feathered creature resembling a chicken. Nothing could make this situation seem noble or heroic, and perhaps to recognize this fact, the music takes a sharp turn away from the more serious style of the rest of the game. The music for these races emphasizes wackiness, employing exaggerated ethnic musical styles that bear no relation to the fantasy world of the game. During these races, the player also hears both disco and techno, which are not heard anywhere else. By virtue of these distinct and atypical styles, the music of the racing minigames serves to separate them from the rest of the *Final Fantasy VII* world.

I'd also like to mention something known as diegetic music, or music that is considered to exist in the world of the characters. This music will usually play through a location-specific sound system. The characters in the game will sometimes be able to turn this sound system on and off, but not always. You'd expect your player character to be able to manipulate the on/off status of an in-game radio, music player, computer, video game machine, television, or something similar. Alternatively, the sound system may form a part of the environment that isn't accessible by the player. Examples would include an in-game public address system, a movie playing in a movie theater, piped music inside a store or other similar public location, etc. This music can also be considered to fall inside the music-as-demarcation technique, because the musical style may have nothing whatsoever to do with the style that typifies the rest of the game score. As such, it will often impress on the player a sense of separation.

One example of diegetic music is found in the classic game *Space Quest: The Sarien Encounter* from Sierra, where the player can enter an establishment called The Rocket Bar and enjoy the music of a floor show that rotates between an 80s-style pop vixen, a suit-wearing blues duo, and a pair of bearded guitar-toting hard rockers. Composer Ken Allen's soundtrack for these in-game performers distinctly separates The Rocket Bar from the alien desert world that exists just outside the door. Music like this can't be found anywhere else in the game.

Diegetic music is also where you will find a lot of licensed songs (i.e., music that was not written originally for the game). As composers we should be aware of how licensed music in a game may compare and contrast with our own musical score. We are also at times asked to create music that feels as though it were licensed rather than written for the game. For instance, with the *Speed Racer* video game I wrote song-style tracks in the traditional length for radio airplay because the racing-game aficionado is accustomed to licensed music in racing games. Often the music in racing games is offered up with a jukebox style of presentation. This approach is such a traditional part of the racing genre that a player could possibly be disconcerted if the music deviated from the norm, so the decision was made to adhere to a contemporary song–like format.

Regardless of the game genre, when asked to write music that shares common traits with licensed tracks, it is very beneficial to be familiar with how licensed music has traditionally been used in games. The *Grand Theft Auto* series (Rockstar Games) features radio stations themed to particular music genres, evoking the selection one would find by tuning the dial of a typical car radio. This use of licensed music fits comfortably within the context of driving a car and separates this experience from the rest of the game. As with the car radios in *Grand Theft Auto*, when we are asked to create tracks that are reminiscent of licensed music, it is often for use on an in-game radio or jukebox. These tracks feel right at home in their appropriate environment.

Sometimes, however, the use of contextual music can actually create an almost uncomfortable dichotomy between the emotion of the music and the activity of the game. In *Bioshock*, the environment frequently features piped-in music originally written and recorded from the late 1930s through the 1950s. This makes contextual sense when considering that the setting is a utopian, art-deco underwater city built in the 1940s and rising to its peak of

accomplishment in the 1950s. However, the events of the game occur in 1960, when the city has crumbled to an unstable underwater ruin filled with genetically altered freaks of nature. There are areas of the city where cheery music of the 30s, 40s, and 50s continues to drift through the corridors, creating an uncomfortable dichotomy that is purposefully used for dramatic effect. Killing a crazed mutant to the strains of Bing Crosby's "Wrap Your Troubles in Dreams" can be pretty disconcerting.

Conclusion

One of the best things about being a video game composer is the amazing diversity of the projects we get to work on. There are a lot of choices to make and details to consider when determining the role and function of game music in any particular project. Don't be overwhelmed. Consider it empowering. All these possibilities have enormous potential to inspire and challenge us. Each role and function of music is also a potential avenue of creative expression.

The approaches that I have described in this chapter reflect those that I have encountered or employed in my career so far. I expect to encounter many more in the future. Who can predict the coming advances in the exploding field of video game design? New innovations introduce changes in the fundamental design of games, which in turn force us to reconsider our strategies and flex our creative muscles in new directions.

7

Preparation and Workflow

I watched the rabbit, dangling by its ears precariously over the head of the bear. The great brown beast looked up at this potential snack with a keen interest, but for the moment he could do nothing but wait. The cuteness factor embodied by the bunny was tremendously high, augmented by the accompanying sense of impending doom. While this was going on, a game developer explained that the options for this gameplay situation were manifold. The bear and the bunny could become friends. They could simply ignore each other. The bunny might even intimidate the bear. But the bear could also simply eat the bunny, particularly if we offered it conveniently to him. With that, the game developer dangled the hapless rabbit closer to the bear's gaping mouth. "No!" I shouted, involuntarily. There was a chuckle around the table.

Contract composers typically join the team relatively late in a project's development, which means we need to be briefed on the nature of the game and how our musical compositions can make a positive contribution to the whole. In this creative meeting at the headquarters of Electronic Arts, I was getting my first look at *SimAnimals*, which would be the latest incarnation of the smash-hit *Sims* franchise. Though the helpless bunny was *not* fed to the bear during our meeting, its momentary plight did cause me to become more emotionally invested in the game. The creative briefings at Electronic Arts helped me understand the underlying game mechanic (which involved either nurturing the animals or causing havoc among them). Finally, the experience of meeting the *SimAnimals* team and being exposed to their excitement for the project served to kindle my own enthusiasm—and that was my most valuable takeaway from my visit there.

Enthusiasm is our very best creative tool. It fires our imagination, gives us energy, supplies us with ideas, and eases the difficulties of problem solving. There's nothing like enthusiasm for making our workdays more enjoyable and increasing both the quantity and the quality of our creative endeavors. According to an article written for *M/C Journal of Media and Culture* by researchers from the University of London, "Enthusiasm is part of the creative act. It can unleash energies and overcome self-imposed limitations . . . this is what makes it one of the most precious commodities in the creative industries" (Bachmann and Wittel 2009). One of the easiest ways for us to light that spark of enthusiasm is to let the game development team do it for us. The team has been living and breathing their project for a long time before we're ever made aware of it. From the very beginning of development, they've worked hard to envision their game through inspiring works of visual art, richly detailed background literature, and documents exploring the intricacies of their game's proposed design and mechanics. By the time we're brought into the development process, the combined passions and talents of the team have already swept them into a wave of enthusiastic momentum. We have to make sure that we catch that wave, too.

Preparation

Contract composers such as myself tend to do most of our work off-site. We communicate with game developers via phone calls, e-mails, online chats, and files sent back and forth using FTP (file transfer protocol) sites. Because of the distance between us, we may not be viewed as really *part* of the team, even though that's exactly what we are. With this subtle estrangement at work, developers may feel some reluctance to share their internal materials with us. This can be frustrating, but we should try to remember that they have reason to be nervous about sharing their work product beyond the four walls of their studio. Devastating damage has resulted in the past from game development materials being prematurely leaked to the public. With leaks such as these, the marketing team loses the ability to control the image of the product, which can then become tainted by public reaction to early materials that are clearly far from complete. Nevertheless, we must strongly insist on receiving these materials, secure in the knowledge that when we sign a non-disclosure agreement with their company (which is standard practice in the industry now), we become entitled to the same level of access as any other member of the team.

Requesting materials from the development team is an essential step toward preparing ourselves for a new project. This mental preparation is vital. The more materials that the development team shares with us, the better chance we have of creating music that embodies their vision. Let's discuss some of the types of materials we can request from the development team and how they'll help us to compose the best possible music for their game.

Materials to Request: Gameplay Capture

As we've previously discussed, a gameplay capture is a video that shows a game being played. When the game is still in development, a gameplay capture video bears little resemblance to the sorts of videos we might see of a final game. Taken from an early stage of the development process, the video may display visually incomplete characters and perhaps also missing or malfunctioning animations. The environments may be almost empty, with little but a featureless sky and a floor marked with a grid. If the gameplay capture is taken from a later stage, we may then see more complete characters but simplistically "blocked-in" environments, or perhaps there may be fully realized surroundings but the characters still do not move correctly or interact with the setting in a realistic way.

On first impression, it may seem that such videos will offer little help to us, but that's far from the case. We should set aside whatever state of completion may exist and focus on the video as a visual demonstration of the game's design. Game capture videos are in motion—a quality that distinguishes this resource from most others we'll receive. As composers, one of our most important tools is rhythm, and in a video game there is a kind of visual rhythm that permeates the experience. Characters run, jump, climb, walk, and fight to their own distinct beat structures. Environments feature twists and turns, obstacles and exploration opportunities that interact with the internal rhythm of the characters, adding a sort of visual syncopation. No matter how long we may study the more static design materials, nothing can replace gameplay capture for its ability to help us determine the right momentum for our music. In cases where the gameplay capture is in its very early stages, we just have to employ a little imagination to fill in the gaps and smooth out the rough edges.

Typically, we'll receive these capture videos as movie files in one of several possible formats (Quicktime MOV, Windows AVI, MP4, etc.). File size can become an issue of concern, not in terms of viewing dimensions but megabytes. The video file size should be large enough that the image is clear but not so large that it takes an inordinately long time to download or causes problems when we're trying to load it into our other music software so that we can view it while we're working. We shouldn't be afraid to ask for a replacement version of a video if it is too blurry for us to distinguish or if downloading a set of videos takes hours. Converting a gameplay capture video into a more advantageous format and file size isn't all that difficult a task for our supervisor on the development team, and once the best format has been selected, it can be used for the rest of the project.

Materials to Request: Design Documents

A game design document (GDD) expresses the plan that the development studio intends to follow in the creation of their game. Typically, the game design document will be a work in progress for the entire duration of development, constantly revised to reflect any artistic or strategic adjustments that are made in the game's design. As such, the game design document serves as a vital tool whereby all the various departments (art, programming, writing, sound, etc.) keep abreast of any changes underway that may impact their work.

Design documents don't follow any standard format. Some can be over a hundred pages long, arranged into chapters that are separated by subheadings, with lots of illustrations. Others may only offer a few pages of block text. Regardless of the format and length, we can be confident in assuming that every project has a design document of some kind, and as soon as we are hired, we should immediately request it. The design document is an invaluable resource for us as game composers. There are several types of design documents that we may receive and it's not always immediately apparent what type we've been given. Nevertheless, all of the possible varieties can be helpful to us.

The *game concept document* is usually a short overview of the game that was prepared at the very beginning of development for the purposes of obtaining approval so that the project could move forward. The concept document paints a picture of what the proposed game will be like, but it usually does so in pretty broad strokes. Also, if we receive a concept document but the game project is well into development, then it is likely that at least a portion of the information in the document is inaccurate. At this point we can go ahead and ask if there is a more current design document available, but we should certainly read the concept document and think about the way the developers described their project in its initial stages. Preliminary aspirations during a game's development are inevitably scaled back somewhat, and later design documents may not incorporate the first impetus that fueled the team's excitement for their project. Therefore, the concept document can give us tremendous insight into the

earliest thought process of the development team.

A *music design document* constitutes the team's attempt to develop an overall strategy for music requisition and implementation. We should be aware that this document may be an excerpt from the full design document. If we have not yet received the full version, we should definitely request it. The music document will usually not describe any gameplay or story elements and will instead focus solely on the amount, placement, and style of music that will be incorporated into the game. Sometimes these descriptions can provide a wealth of insight into how the developers imagine music complementing their project and what types of music might best integrate with gameplay. Other times, there is little information provided or the information seems to assume facts that are now inaccurate (such as a music plan that doesn't involve hiring a composer). At any rate, we should carefully read the document and prepare a list of questions should the need arise.

A complete game design document will describe the entire game in full, including all of the gameplay mechanics, story elements, user interface designs, locations, characters, and situations. Some of this content will be thoroughly fascinating to us as game composers, and we'll want to read it in depth. Other sections may stray into technical areas that have little bearing on our work, although we should certainly look over these sections to make sure we aren't missing anything that may interest us or stimulate our creativity. The full GDD is a treasure trove of inspiration and we should make sure to consult it often while we compose music for the game. At its heart, this document is a testament to the aspirations of the game development team. It expresses the perfect conception and execution of their vision. While such perfection may never be attained in reality, it must always inform our efforts as composers. With the mental image of this perfection conjured in our minds, we have a much better chance of creating music that connects well to the final game. The GDD is an irreplaceable resource and we should do everything we can to make sure we receive it. It provides us with an opportunity to look inside the developers' minds—to see what they *really* want their game to be.

Materials to Request: Dialogue Script

Not every project contains dialogue. I've worked on a few projects that didn't have any dialogue and still managed to tell charming stories in clever ways. Some projects eschew story and dialogue altogether in favor of pure gameplay. But for those projects that have dialogue, the dialogue script (sometimes called the *game script*) is an important document for a game composer to request.

Often dialogue scripts are configured in a style very similar to screenplay format. However, one of the big differences between a game's dialogue script and a traditional screenplay is that the order of events in the dialogue script will sometimes proceed unpredictably during actual gameplay. It takes a special talent to construct a story, believable characters, and compelling incidents, all while compensating for the fact that events may unfold in unforeseeable ways.

A dialogue script is always fascinating to read. It allows us to understand the personalities of the characters on a deeper level while appreciating the interactive nature of the storyline and the many ways in which the player can influence the plot. Reading the dialogue script can be tremendously helpful when formulating a plan for the overall structure and aesthetic of the game's musical score. We should try to absorb and internalize the dialogue so that we can appreciate its innate style. The dialogue may feel punchy, aggressive, and clipped, or it may flow with a sense of interconnectedness and grace. Both possibilities can assert a strong influence on the lengths and rhythms of the musical motifs and figures that we compose. We'll need to develop a familiarity with the dialogue script in order to contemplate these choices.

Our need for the dialogue script often goes beyond the guidance it can provide for musical style. When we are tasked with writing music for a particular sequence of story-driven events in the game, we need the dialogue script to aid us in understanding that portion of the story. Otherwise, we may become confused about the significance of those events in the context of the game's larger plot. Reading the script can provide immense clarity, enabling us to make determinations and adjust our composition strategies accordingly.

Materials to Request: Concept Art

When we ask the developers to send us concept art, we're essentially asking to see the visual soul of the project. Concept art is created early in the game's development and is designed to beautifully capture the visual aesthetic of the environments and characters. Like the game design document, the images you'll find in concept art represent perfect realizations of an artistic vision. This is the ideal, endowed fully with every ounce of the team's enthusiasm and imagination.

Apart from the pure enjoyment factor inherent in receiving these images (which can be truly gorgeous), the benefits to our music composition process can be significant. Whereas reading the dialogue script and watching gameplay capture can inform us of the rhythm and pacing of the game, concept art speaks eloquently of the overall atmosphere. Sometimes, it's difficult to glean this sense of ambience from a script or from the capture files of gameplay in various stages of completion. These are only portions of the whole picture. A work of concept art, however, is a complete picture of a visual style.

Sometimes concept art will depict the main character of the game. This representation can tell us a lot about the character's inner motivations, even beyond what the dialogue script is able to convey. Subtle cues in body language, the expression in the eyes, the emotional attitude conveyed by the degree of tension in the mouth and forehead, the way in which the character positions his or her hands, arms, and legs . . . all of this can speak volumes. Also, the character's costume is likely to be shown here in its most artistically evocative manner. Small details, difficult to perceive when the character is moving, become vividly highlighted in the concept art. The positioning of weapons, the flow and drape of fabrics, the presence or absence of ornamentation, the severity or softness of hairstyle—all of these combine to create a strong impression of a character's core identity.

When the concept art depicts environments and locations, we can learn much about the general emotional atmosphere that the game is meant to convey. Grim color palettes and stark lighting may cast otherwise innocent structures and natural landmarks into dour and forbidding shadows. Graceful curves and imaginative color combinations can express the whimsy and curiosity of a delightfully odd landscape. Sharp geometrics and vivid contrasts may present the surreal perfection of a futuristic world. In each work of concept art, the choices of the artist have been guided by lengthy conversations among the developers as they struggled to make stylistic choices with deep implications for their game. Though we often have not been privy to these conversations, we can thankfully see their results in these suggestive images.

Developers will not always be willing to send concept art, but we should always ask for it. In terms of sheer inspiration, concept art is unmatched. The beauty and emotional power of a game's concept art can speak directly to our subconscious minds and inform our work on many levels. If concept art is meant to inspire the creative team to a singular vision, then it should always be made available to the game's composer—it enables us to create music that invokes the same inspiration.

Materials to Request: Storyboards

Although we will not always work on projects in which storyboards have been prepared, when they are available we should request them. Video game storyboards generally consist of pencil drawings arranged as a sequence of frames, similar to the layout of a graphic novel. The detail in these drawings can range from rudimentary to intricate, so for the purposes of artistic inspiration it is often difficult to predict how useful a storyboard will be to us. However, a storyboard can be very helpful if it is able to clarify the nature and order of events in an action sequence when the dialogue script does not provide sufficient details for us to understand how these actions proceed.

Some video game projects reject the storyboard concept in favor of other solutions. Alternatives to storyboarding may include simple text descriptions, either interjected in the dialogue script or inserted into the game design document, or graphical flowcharts in which concept art is laid out in a diagram with arrows indicating the correct sequence of events. Storyboards are not always an essential resource, but we should mention them when we are requesting materials at the beginning of a game project. We'll want to see them if they exist, if only to make sure that the actions they depict correspond to our understanding of how things occur in the game.

Materials to Request: Music Asset List

This is the most important item in our list of requested materials, and should normally be the easiest item for us to obtain. A music asset list is an educated estimate of the game's musical requirements, broken down into tracks with information about length, musical style, and placement within the game. The nature of asset lists can vary greatly depending on the internal practices of the development studio. Most of the lists I've been given have been formatted in Microsoft Excel, although I have received a few in Microsoft Word, Portable Document Format (PDF), or plain text (TXT). Some of the lists have included descriptions of the projected state of gameplay that will exist during the triggering of each music track, but some did not. A few described the desired musical style for each track, but many didn't. In some cases, we can infer that the music asset list may be considered an adjunct organizational tool, complemented by conversations between the developers and the composer. While conversations are highly desirable, in my experience documentation is an important way to ensure that everyone understands the project's

musical requirements. If at all possible, we should urge the developers to include more detail in the music asset list. The more of this information can be documented, the less confusion will result as the project progresses.

Track Name	Length	Description	Track Style	Gameplay	Loop?	Notes
mus_lvl1_ship	3 min	Explore the ship	Electronic	Explore	No	Keep this sparse
mus_lvl1_door	1.5 min	Hacking door locks	Glitch Synth	Puzzle	Yes	Tense, suspenseful
mus_lvl1_hangar	3 min	Hangar bay ambush	Orch & Synth	Combat	Yes	Chaotic & dissonant
mus_lvl1_boss	2.5 min	Fight the Sentinel	Orch & Synth	Combat	Yes	Thematic track

Figure 7.1
A music asset list excerpt from a hypothetical sci-fi video game.

As I mentioned, a music asset list is sometimes only an educated estimate, in which case, the contents of the list may be subject to change. Sometimes, music asset lists undergo multiple revisions (in a manner similar to the way in which game design documents are revised). As an extreme example, I've worked on projects where the music asset list was completely thrown out and replaced in mid-development. A good flow of communication will ensure that we stay abreast of any changes that may have an impact on the music asset list, so it is important that we stay in close contact with our direct supervisors at the publisher or development studio.

Finally, I'd like to mention another challenging issue that may arise when we request a music asset list: occasionally, the developer may be unwilling to give us such a list. While in my experience this is rare, it does happen. Many factors can contribute to this situation, including massive upheaval in the project's development (which may make it difficult to formulate a complete asset list), and a development team following an organizational methodology based around management techniques such as *Agile*.

Agile was created to address the difficulty of planning large software development projects that are often subject to changing goals as the projects progress. With the understanding that it is impossible to estimate the requirements of such a software system until after users have been able to work with an operational version, emphasis is placed on short-term planning and the periodic delivery of functioning prototypes. These prototypes often consist of some percentage of the software that has been rendered functional so that it can be tested. At the core of this methodology is constant iteration, punctuated by regularly scheduled feedback at short intervals. Short-term planning allows for goals to be amended during a project's development because no requirement exists to adhere to a long-term plan.

For an external contract composer, such a working method can pose a few problems. Instead of receiving a complete music asset list, we may periodically receive requisitions for a small number of tracks without any information concerning what the nature of future track requests will be. While difficult, it is possible to create a satisfying musical score while working with a team employing Agile (or another similar methodology). Our goal in these circumstances should be to create a sense of cohesion throughout by emphasizing common elements among all tracks, since we will not be able to plan very far ahead.

Materials to Request: Cinematics

In many game projects (particularly those with a strong narrative emphasis), the game composer will be required to create music for cinematics, which are short videos resembling a scene from a film. Cinematics offer many advantages to the developer, particularly in regard to dramatic presentation. In a cinematic, details like camera angles, lighting, and editing can be tightly controlled. Also, a cinematic may allow the developer to show characters and environments with a higher degree of detail and expressiveness than the game engine can convey.

A game cinematic enables the game composer to score the action with the same techniques used for film and television—we can score "to picture," secure in the knowledge that the sequence of events and their timings will not change. If we will be required to score cinematics, then the music asset list will usually include them—but if the cinematics are in their earliest stages, then the list may not be able to provide correct timings. Sometimes the cinematics are omitted altogether from the list and then added in a later revision.

As soon as we become aware that we will be scoring cinematics, we should ask to receive video files of them. It may take a while for these files to be prepared, so it is important that we ask for them as early as possible. Often, the cinematics will be produced by an external studio, which means that our project supervisor will need to make

requests of that studio, wait for replies, and then relay that information to us. This can slow the process down, so it becomes very important for us to stay on top of the situation. The earlier we can receive those video files, the more time we'll have to create music for them.

Cinematics are not always necessary for a game to tell a story successfully. They can be expensive and time-consuming to produce. This may be why cinematics are usually created for dramatic points in a game's storyline or momentous "wow" moments at the pinnacle of a game's action sequences. Because cinematics tend to occupy important positions in the overall game, their music should resonate with significance. Usually, cinematics are the last elements we'll be scoring (since we'll likely be receiving the video files toward the very end of music production). This can be a blessing in disguise, as it is likely that we'll have already established all of our musical choices, including the possible use of leitmotifs and the way in which certain characters and situations are musically treated. Faithfully applying these choices to the cinematics is a wonderful way to musically bind the entire project together, lending the in-game music extra symbolic significance because of the reinforced meaning it receives by virtue of its cinematic use.

I'd like to return briefly to the importance of requesting the cinematic video files early and offer a side note. While this is likely to be a very rare occurrence, it is possible to encounter a game development team that asks us to compose cinematic music without ever sending the associated video files to us. Scoring a cinematic without receiving the visuals is very far from ideal, and we should attempt to respectfully communicate this sentiment in the hopes that the situation is rectified. Again, conditions such as these are very rare, and many composers may never encounter them. However, I have grappled with this issue more than once.

Sometimes the problem may be due to simple scheduling—the developers want to get the music done early in the game's development cycle, which means that the cinematics themselves will not be created until the music production phase is long over. On the other hand, there are occasions in which the developer may not actually want us to literally score the cinematics and would rather have us provide dramatic music that can be "used anywhere," which they then plan to splice together to fit the visuals (when such visuals become available). Either way, these are the least desirable circumstances in which to create cinematic music. If the developer feels that the cinematics can't be scored any other way, then we will have to use our imaginations and improvise. Limitations such as these may compel us to think in new directions, stimulating our minds to formulate unexpected solutions. That being said, we should make sure to ask for the cinematic videos as early as we can, because it is always preferable to receive them.

Materials to Request: Game Builds

Finally, we come to game builds, which are working, playable prototypes of the actual game in progress. When it is possible to receive these builds, we should absolutely request them. They can be very inspiring and informative. There are, however, a number of reasons why developers don't (or can't) send game builds to the contract composer.

In order to play the game build of a console game, we must have a *test kit* on hand. A test kit is a modified game console that is able to run game builds in various stages of development. Test kits are included as one of the components of the software development kit (SDK) distributed by the console manufacturer. The three major manufacturers of consoles (Microsoft, Nintendo, and Sony) provide these kits to developers in order to enable them to create games for their platforms. While Nintendo and Sony make these SDKs available only to licensed development companies, Microsoft has instituted a policy that enables composers to purchase full software development kits (including the test kit hardware). Freelance composers who are currently under contract to create music for a Microsoft console game can submit an application to the *Registered Content Creator Program.* Although this program allows us to actually buy a console SDK outright, we'll be able to do so only when we've been hired for a game destined for a Microsoft platform. Unfortunately, as of this writing, Nintendo and Sony do not offer similar programs.

Even though we'll never qualify as licensed developers for Sony or Nintendo consoles, it may be possible for a game development company to loan us a test kit for the duration of a project. Considering the hefty fine they would incur should a test kit be lost, developers are typically extremely reluctant to provide one. I've worked with a loaner test kit only once. During that project, the developer would regularly send me updated builds of the game while I composed the music. The ability to play the game while composing the music for it was fantastically inspiring.

Generally speaking, obtaining a game build for a PC game can be much easier than obtaining the build for a console game. In this case, a test kit is not required. We can simply download the game's installer from the

developer's secure server via FTP, install it in our computer, and begin playing. I've worked on PC projects that have allowed me to play game builds in this way, and it was both incredibly convenient and great fun. For one particular game designed to be an online experience, the developers updated the game build from their server and those updates filtered down to my computer automatically. This way I was able to stay in touch with the current state of the game as it progressed through the development process.

A game build is a fantastic resource for us as game composers, and we should definitely request it—particularly if we are working on a PC game. The game build enhances our understanding of and appreciation for all of the other documents, videos, and artwork we may receive from the developers, helping us to form a clear picture in our minds of the final game. Most important, all these materials can combine to kindle our enthusiasm for the project. This excitement helps us to create memorable music that enhances play and deepens the player experience.

Workflow

Video game development is a collaborative process. While a development company may separate its employees into groups of artists, programmers, designers, testers, and audio engineers, everyone understands that their efforts are coming together to realize a singular vision. Composers like ourselves are no different, whether we work on-site or remotely. Our efforts combine with those of the rest of the team to create a cohesive entertainment product. At the beginning of a project, it is vitally important for us to develop a good working relationship with our immediate supervisor, enabling a smooth workflow. This person will be our connection to the rest of the team, facilitating productive two-way communication. For some projects, this may be the only team member with whom we directly communicate. Our supervisor will be the one to gather the resources we need and make them available to us.

If it is possible to visit the development studio and meet with some of the other team members, we should certainly do so. Meeting with the team can provide wonderful insight. Just a casual face-to-face discussion of the game can reveal overlooked characteristics and quirky features of the project that can't be gleaned from a design document or a piece of concept art. When the development studio is close enough to our music studio to make a visit possible, we should certainly do everything we can to arrange one. It's not always possible to arrange a visit, though. As an American-based game composer, many of my projects have been with companies in countries such as France, Australia, New Zealand, Italy, Belgium, and the United Kingdom, which makes organizing an in-person visit impractical. In those situations, online communication can bridge the geographical distance, making us feel closer to our collaborators overseas.

Whatever our means of interaction, our first objective should always be to make sure that everyone is in agreement about musical style. In some cases, discussions on this subject will take place and we'll be given the opportunity to present our own ideas about musical style for the game. In other cases, the developers will already have a concept in mind of what the game's musical style should be, and discussions then focus on refining that abstract concept into concrete techniques, instrumentation choices, and genre influences. If we can get everyone to agree on a musical approach as early as possible, then the workflow from that point forward will have the potential to be much smoother and more productive.

After these discussions, the musical style for the project should hopefully be clarified for both the development team and ourselves, allowing us to get started. Invigorated by all the enthusiasm flowing to us from the development team, we may be tempted to jump headfirst into the deep end of the pool and begin cranking out tracks. Before we do that, it can be very helpful if we also begin incorporating some ongoing parallel pursuits that support our creative work.

Parallel Pursuit: Research

This may seem redundant—after all, didn't we thoroughly examine the materials that the team gave us? Wouldn't that be considered research? Yes it would, but we should also remember that the team's materials will always reflect *their* foremost concerns: art style, gameplay, story, difficulty, fun . . . all the crucial components about which they will obsess from the game's inception through its completion. These don't necessarily reflect *our* obsessions, though. Doubtless by the time we've reached this stage, we're enthusiastically contemplating the possibilities of the musical genre that we'll be exploring in the composition of this video game score. We'll be making tentative plans regarding instrumental choices for particular tracks, considering how musical texture and tone color will interact with the game's atmosphere, and imagining the possible ebb and flow of melodic lines. This is the ideal time to begin some self-directed research specifically guided by our own musical interests.

In the case of a historical game, our research may lead toward music of the time period, including instruments that might have been used, prevalent rhythms, common chord progressions, and conventional formats for different types of music popular at the time. These musical qualities will be profoundly influenced by the geographic location in which the action occurs, so we'll need to take that into consideration. We may begin developing a library of reference tracks that we'll consult throughout the composition process, using them as guidance for historical authenticity. While our own compositions will certainly be structured around the story and activities of the game, the historical style can provide us with lots of intriguing instrumental and stylistic alternatives.

If the game takes place in a modern-day setting, our research may focus on the prerequisites of the music genre that will define this contemporary score. Often we'll have to learn about a facet of contemporary music that we may not have been intimately familiar with before. For instance, if the development team has expressed a wish for a hardcore punk influence in the score, we may need to begin building up a music library of hardcore punk. In this case, we should look for those tracks that most intrigue and interest us. When we keep an open mind, there's no musical genre that can't tickle our fancy.

If the game takes place in a completely imaginary world, we may be confused at first as to whether research is possible. We shouldn't be discouraged, though. All ideas have their origin in the realm of human experience, so if we look hard enough, we'll see parallels between the fantasy world and our own. For example, the primitive nomadic clans in that traditional high fantasy setting may seem reminiscent of a Gallic tribal society of the Iron Age, and this would point us in the direction of Gallic musical instruments and techniques. On the other hand, the eerily solemn aliens in that futuristic space adventure may remind us vaguely of Zen spiritualism, leading us to a study of the folk music of India. Half of the fun in this sort of research lies in discovering the parallels between fantasy and reality. The results can fuel our excitement for our work.

If we have decided to spotlight particular acoustic instruments in our score, we may want to avail ourselves of the wondrous riches to be had by searching video sites such as YouTube and Vimeo for solo performances of the instruments in question. I am continually amazed by the generosity of the Internet community in this regard. There are instructional videos demonstrating rare instruments, videos that teach newcomers proper playing methods, showcases of virtuoso performances, and patient step-by-step training for more advanced techniques. Whether we are composing with the intent of hiring live musicians for final recordings or we are using sample libraries to achieve an effective instrumental simulation, these instructional videos can be invaluable.

Music-oriented research has the ability to yield unexpected results, allowing us to use contrasting influences to compose uniquely original music. Such research can continue to be inspiring throughout an entire project, and we need never consider these investigations to be complete. Interspersing periods of research amid our composition work can keep us fresh and motivated, while providing us with a welcome break from the rigors of creative composition.

Parallel Pursuit: Sound Palette Expansion

Upgrading our music studios while in the middle of a project is never a good idea, and can lead to disastrous consequences such as computer and hard drive failures. It's best if we put off installing new software packages, upgrading existing ones to the latest versions, or integrating new networking hardware until after a project concludes, unless our current tools have already suffered complete failure. Such breakdowns may leave us with little choice, but if it is at all possible to work around failures like these rather than perform risky upgrades while under a deadline, then we are always better off doing so. That being said, let's discuss one type of studio improvement that can be safely undertaken while in the middle of music production: sound palette expansion.

The musical style of a project may require us to obtain specific musical instrumentation, which can take the form of sound modules, virtual instruments, and sample libraries. While we may hope that our preexisting sound palette will be up to the task, more often than not we'll need to assess the gaps in our collection and begin making purchases. I usually try to conduct a thorough evaluation of the project's possible needs as early as possible, followed by a critical analysis of my current studio's capabilities. Then I start making purchases right away, allowing time for boxed products to ship. Most music budgets will not allow room for purchases like these, so they typically come out of the composer's creative fee.

For example, when I first started music composition work for the *Speed Racer* video game, it seemed clear that the overall style of the project would be a combination of orchestral action juxtaposed against a funky/retro/futuristic vibe with a driving rhythm. While confident about the orchestral and rhythmic side of things, I knew that I would need to broaden my studio's sound palette to incorporate a lot more analog synths. Some would need to strongly

evoke beloved retro synthesizers and others would need to communicate quirky and oddball qualities all their own. At the start of the project I tried to make accurate predictions about my upcoming synth needs. Yet despite my attempt at a precise forecast, as music composition progressed I found myself continually stumbling against unexpected gaps in my instrument collections. In emergency situations like these, we can be thankful that virtual instrument developers have built up the infrastructure to allow composers to instantly download many of their products. For *Speed Racer,* I made downloadable purchases during the creation of many tracks, and was very grateful for this online assistance.

Thoughts on Workflow

For the in-house game composer, workflow will certainly be regulated by the direct and constant supervision of other members of the development team. In these circumstances, the day-to-day experience will depend largely on the company culture—how much room employees are given to determine their own working methods versus how many company-wide policies may be imposed.

For the external contract composer, the everyday working environment is similar to that experienced by those who work at home. Researchers report in a study conducted at Uppsala University in Sweden that teleworkers such as ourselves experience a better balance between work and our lives outside of it, but that we also tend to work much longer hours and take on a much heavier workload (Åborg, Ericson, and Fernström 2002). In the video game industry, notorious for placing extraordinary personal stresses on its workers, a contract composer may have an even more demanding professional life than the typical teleworker. To navigate these challenges, we will need to be able to work well and productively without close supervision, finding personal fulfillment without the need for the diverse social interaction found in a public workplace. The life of a game composer can be solitary and internally driven, but for those of us who thrive in such an environment, the career offers rich rewards. As we embark on our day, armed with all the materials from the game developer as well as our own personal research and creative tools, we should feel well equipped to formulate a workflow that will allow us to successfully meet our deadlines.

Every composer will have a unique working process, and I would not like to suggest that there is a preferable method. Workflow strategies for game composition will depend on our own personalities, the schedule of our projects, and the nature of our compositions. Whatever our daily working strategies may be, it is important for us to establish a system and stick to it, if only to make sure that our output is proceeding in a predictable manner and that our deadlines can be met. In the end, we should try to arrange our workflow so that it allows us to create in the most conducive environment. When we are well prepared, with all the materials and information we need in order to excel, we can stay on schedule and deliver music that fully expresses the team's creative vision.

8

The Development Team

As game composers, our creative output has a strong influence on the rest of the team, whether we know it or not. Even after the project is complete, we'll often have no idea how deep our creative impact might have been. Our music might have serenaded the team through headphones while they were creating textures, refining animations, and testing gameplay designs. Over the course of development, our music might have inspired the team to make changes in their own work ranging from subtle tweaks to the visual style of a single location to complete redesigns of entire levels. In my own projects, I have encountered circumstances in which team members have quietly let me know that my music had a significant impact on design decisions. This is a rare and generous gift to the game composer, as a development team may not always tell us that these sorts of things have occurred. On those rare occasions when they do share this information with us, it is one way in which we can perceive our own significance as members of the team.

A game composer's goal is to provide the team with music that will both enhance their game and inspire their work. In order to do this, we depend greatly on having access to open lines of communication. Whether we're hired by the development team that will create the game or the publisher that will fund it, oversee its progress, and distribute it, we should make every effort to familiarize ourselves with the key personnel who will be making music decisions. Ideally, we would prefer to communicate directly with all the decision makers, but this is rarely the case. More often, our communications with the team are limited to specific designated supervisors who serve as liaisons. As we go from one game project to another, we'll find that the people assigned the task of coordinating our efforts do not always hold the same job positions within the team, and we may encounter a wide variety of job titles. In addition, the definition of a particular job title may not always be the same from one company to the next. Until there is standardization in job titles at development studios and publishing companies, we will have to refrain from making any assumptions about job responsibilities when we are communicating with team members and discussing their music needs.

The Structure of the Team
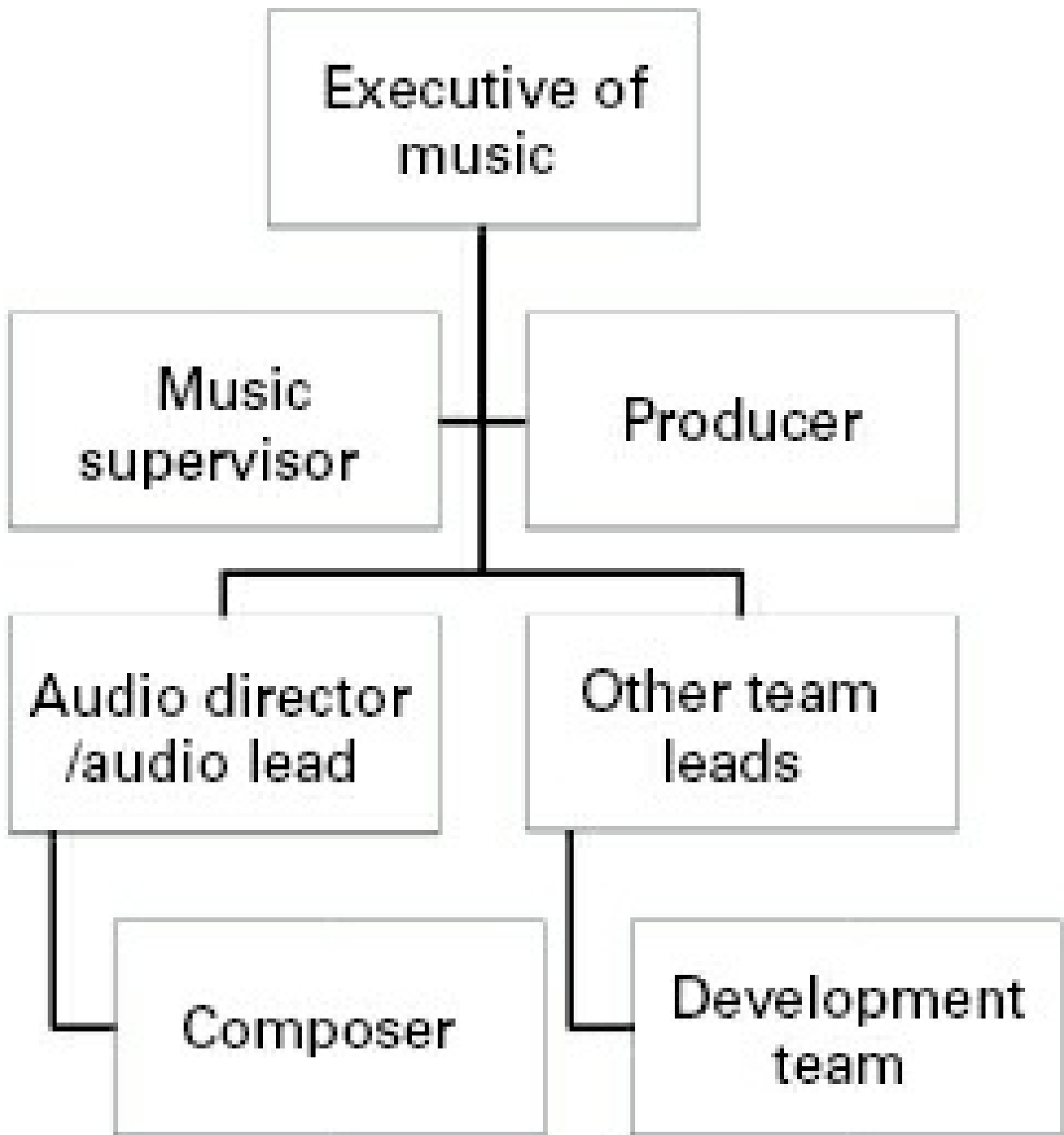
Figure 8.1
Development team hierarchy, as it relates to game composers. Figure includes audio personnel and supervisors. Specifics regarding other team leads and a development team breakdown (including subdivisions) appear in figure 8.2.

Before we launch into an exploration of the music needs of the development team, let's first attempt to familiarize ourselves with the team members we will encounter as our liaisons, the jobs they may hold, and the possible definitions of those job titles.

Music Director/Head of Music/Executive of Music/Vice President of Music

These job positions generally denote a person of great authority. When we encounter these titles, we may also find that the word "worldwide" has been attached to them. Most often, the person bearing one of the above titles is a top-level music executive at a large video game publisher, and our experiences with people at this level of power may be somewhat limited. If the publisher did not hire us directly, then we may never encounter the publisher's highest music executive. In that case, our communications will flow directly through the independent game development company that hired us. However, if the publisher hired us directly, then there is a very good chance that this high-level music executive was the one who signed off on our participation in the project.

In describing the job responsibilities of a music executive at this level, we have to take into account the nature of the publisher at which the executive works. If that publisher specializes in game projects that extensively license popular music (such as sports titles, music/rhythm games, and dancing games), then this music executive may spend a good deal of his or her time negotiating licensing rights and developing ongoing relationships with record companies. Evaluating and selecting score composers will be just one task in a long string of eclectic duties that this executive will need to perform. At other publishers, music licensing may not play as important a role. Regardless, the person bearing a job title such as Music Director, Executive of Music, Head of Music, or Vice President of Music will ultimately be responsible for evaluating the original music needs of upcoming projects.

Some of these music executives take a hands-on approach to the selection and hiring of composers. Others delegate these responsibilities to their production departments or have a staff of subordinates to deal with these decisions. Depending on the organizational structure of the publisher, this top-level music executive may either have an authoritarian power to dictate musical choices to both internal and external developers or simply be positioned as an advisor and coordinator of talent resources. Ideally, this music executive has the ability to define the musical ambitions of nearly all games released by that publisher, pushing each development studio toward musical choices that aspire to ever-higher levels of quality and creativity.

Considering their lofty position within the publisher, it is safe to say that this music executive almost never serves as our primary liaison for a video game project. That being said, special circumstances may occasionally arise that necessitate direct communication with the publisher's top music executive. In an emergency situation (such as a last-minute need for a composer's services in relation to a high-profile project), the top-level music executive may take control and communicate with us directly. Also, a more hands-on music executive may negotiate contracts personally. Finally, if music production on a project is going in a direction contrary to that which was originally intended, the top-level music executive may step in to make a course correction and set everyone back on the right path.

Music Supervisor

This job title occurs almost exclusively within publishers (rather than developers), and the meaning of this title can vary dramatically from one publisher to the next. At some publishers, the music supervisor position is synonymous with that of the top-level music executive (in which case, the preceding discussion would apply). Within other publishing companies, however, the music supervisor may be a position subordinate to the top-level music executive, from whom he or she may receive various work assignments. There can also be several music supervisors, with each responsible for specific projects or tasks. Within this organizational model, music supervisors may be further delineated as either *senior* or *associate,* forming a rank structure. With very large publishers involved in many simultaneous projects, there are clear advantages to such a collection of music supervisors.

For my first video game project, *God of War,* my primary point of contact was a music supervisor. The top-level music executive at Sony Computer Entertainment America introduced me to the music supervisor for the project and throughout my work on *God of War,* this music supervisor remained my primary liaison, relaying requests and supplying me with the materials I needed.

Producer

Working both within publishing companies and as a part of independent development teams, producers' responsibilities are wide ranging. Producers working directly for game publishers are usually tasked with monitoring the status of game development by both independent and in-house development teams. These producers act as the liaison between the development teams and upper management at the publisher. They negotiate contractual agreements, monitor budgets and schedules, and make provisions for quality assurance testing and the preparation of games for release in foreign countries. Finally, producers within publishing companies supervise both the technical and creative endeavors of the development team. In this capacity, a producer at a publishing company may serve as a liaison between the external contract composer and the development team. If the publisher has contracted the composer, then this producer might also have been directly involved in the composer selection process and contract negotiation.

On the other hand, a producer working within an independent, external game development studio can be considered the game's project manager, overseeing the team from a much closer perspective. While a producer working within a publisher may be involved in the oversight of multiple projects at once, an internal producer at a development studio typically focuses on one project at a time. Since the internal producer is a part of the team, the responsibilities of the job may include creative or technical areas not usually falling within a producer's job

description. Particularly for those studios with limited audio personnel, a producer may be responsible for selecting contract composers, working with the composer to develop a plan for the game's musical style, and directing the work of the composer over the course of the game's development.

Producers are usually senior staff members, having ascended the ranks through hard work in multiple job positions before finally attaining their current title. As such, they bring a wealth of experience to the table, as well as a deep comfort level with the everyday activities of their studios and publishing companies. As contract composers, we are likely to find ourselves working often with producers, who may sometimes be complemented by the additional support of associate producers. These are slightly less senior production executives who assist producers in completing tasks. Together, the producer and associate producer will serve as a vital communications link, enabling the development team to convey their wishes and hear our thoughts during music production. In those cases in which a producer steps into a much more hands-on audio development role, our relationship with the producer will more closely resemble one we might have with an audio director.

Audio Director/Audio Lead/Head of Audio

Audio directors can be found in both small game studios and large development studio powerhouses. An audio director is a professional with specialized training in production techniques for dialogue, music, and effects. Some audio directors come from a music background or have worked in the music industry at some point in their careers. Others have backgrounds in film and television sound. Some had previous careers as recording engineers. The majority started their video game careers as entry-level sound designers, wherein they learned the intricacies of game audio and refined their skills until they eventually attained their positions as audio directors.

Depending on the context, the meaning of this job title may vary somewhat. There can be no doubt that the first concern of an audio director is the procurement of strong and effective audio assets that enhance the gameplay experience, including sound effects and ambiences that help immerse the player in the action, voice dialogue that expresses the realistic emotion of the characters, and music that increases the player's overall enjoyment of the game. However, an audio director's role in the creation of these assets may fluctuate depending on the size of the audio department and the size of the overall organization.

For a small independent development studio, the presence of an audio director within the team signals that this developer has chosen to make audio a top priority. Many small development studios do not employ audio staff of any kind, preferring to turn this aspect of their projects over to external contractors. While quality audio can result from this arrangement, the lack of an experienced audio professional on the development team makes overseeing audio production much more challenging. An audio director can focus exclusively on the quality of the audio assets, keeping in close contact with any external asset providers. When performing these duties, the audio director at a small studio is acting very similarly to other audio directors at large studios. However, it should be noted that in a small studio environment, an audio director may also function as the primary (and only) sound designer and composer, effectively eliminating the need to hire other audio professionals. At this point, the audio director title is more ceremonial than literal, since such a person does not direct the audio activities of others.

In contrast, an audio director at a large development studio may be just one of many audio directors, each focused on the needs of a specific project. Such large studios may have multiple projects in simultaneous development, each requiring a separate audio director to oversee the creation and implementation of sound assets. In these circumstances, the job title of Audio Lead may be used to denote the person directing the audio of a particular project, whereas the Audio Director title is retained by one highly experienced audio professional tasked with overseeing the activities of all the audio leads. This person may also be known as the Head of Audio.

While it would make sense for an audio director or audio lead to be our primary point of contact, this is not always the case. When there are no audio professionals at a development studio, we may find ourselves working with external music supervisors at the publishing company or producers working either within the development team or from the publishing side. When there are audio people at the development studio, we may sometimes find that our primary liaison holds the title of Sound Designer.

Sound Designer

The sound designer is the audio professional in the trenches, creating sound effects, going out on location recordings, editing dialog and music files, and working with the programmers to implement audio assets in the game. This job often demands long hours and a grueling schedule. An experienced sound designer is an expert in mixing the hundreds of aural elements that may occur in any moment during gameplay. Some sound designers also exhibit

proficiency in programming languages, and all are comfortable with the latest music production software and audio middleware.

The job description of a sound designer does not typically include the development of a music plan, or the supervision and direction of composers. Yet, sound designers have often been pressed into taking up these responsibilities and assuming the position of de facto audio director or audio lead. When a development studio has no one else available, the sound designer is sometimes volunteered for this task. Some sound designers may be eager to expand their responsibilities in this direction. Others may venture into this new territory with a sense of trepidation. Either way, we should consider these people to be brave souls who are about to embark on a mission for which their professional training may not have adequately prepared them.

As contract composers, we should try to help sound designers in any way possible. Those of us with a number of projects under our belts will be able to familiarize our sound designer liaisons with customary practices regarding music production, scheduling, and submission procedures. For this reason, a development studio intending to assign music oversight to a staff member without experience in this area would be well advised to hire a veteran composer with a proven track record. If, however, both the composer and the sound designer lack experience in music production for games, then it will certainly be a period of rapid growth and learning on both sides.

It is also important for us to remember that our sound designer liaison may be responsible for the creation and implementation of every audio asset in the game. As such, this person may be besieged by sound design work and subsequently afforded little time to devote to the music side of the project. If this is the case, we may receive few materials and limited communication from the sound designer. Our only choice in these circumstances is to do our best with whatever materials and instruction we receive, making every effort to deliver quality music despite any challenges we may face.

The Rest of the Team
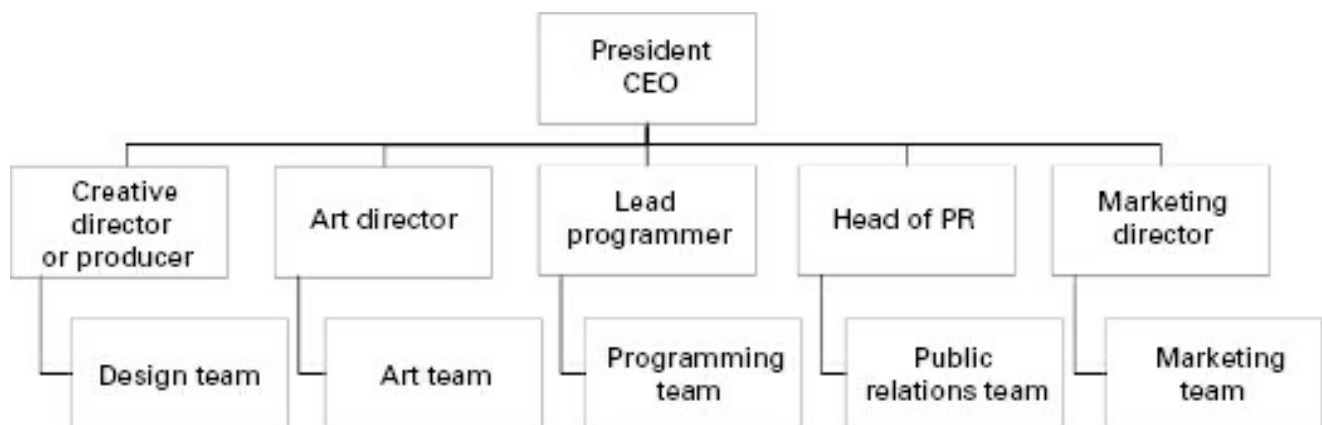
Figure 8.2
A generalized conception of team organization in the game industry. Figure includes common subdivisions in development personnel specialization and leaders of specialized teams. Audio personnel appear in figure 8.1.

Having reviewed the types of personnel with which we may be in direct contact, let's briefly discuss how the rest of the development team is structured. With the exception of very small studios, game development teams are typically divided into departments populated by specialists. Each department has a top-ranking individual who takes charge of that department's progress in either a general sense or in relation to a specific game development project. This person may be designated with the term "lead" as a part of their job title. Let's take a quick look at each of these departments.

The *design team* (headed by a "design lead" or "creative director") is responsible for forming the plan for the structure of gameplay. Some of these designers will focus their attention on gameplay mechanics and the pursuit of the amorphous concept known as the "fun factor." Other designers will concentrate on the geometric construction of levels. If there are producers employed by a game development studio, then they may be considered a part of the design team and may sometimes take the place of the creative director or design lead as the individual in charge of defining the team's mission. The design team is also the one most likely to incorporate writers, who will create any dialogue or story elements present in the game. The design document and the dialogue script (should there be one)

will be authored from within this team.

The *art team* (managed by an "art lead" or an "art director") creates and executes the visual presentation of the game, including environments, characters, animations, and menus. The art team may also be responsible for cinematics (although these are sometimes created by outside firms or are handled by a dedicated cinematics team within the developer). Members of this team will also generate concept art.

The *programming team* (directed by a "lead programmer") writes the code that enables the game software to function, allowing it to calculate variables such as artificial intelligence and physics, as well as handle the enormous amount of independent objects and assets that the game must juggle from moment to moment in order to present a convincing and coherent world. Further specialized, the audio programmer applies coding knowledge to the implementation of music and sound within the game software. For very large studios, there may be enough dedicated audio programmers to form their own team, headed by a "lead audio programmer." Within smaller game development studios, the audio programmer may come from the general pool of programming personnel and be considered on loan to the audio department for the purpose of implementing code for the integration of sound assets into the game. In the smallest studios, there may be only one programmer responsible for every line of code in the game.

The *marketing* and *public relations teams* (led by a "head of PR" or "PR manager" and a "marketing director" or "marketing manager," respectively) aren't part of the development process. However, there are times when these teams use music from game composers as part of promotional and marketing materials. Both the marketing and PR teams are dedicated to spreading the word about a video game project, using differing means. The marketing team creates advertisements and spends money to place these ads where consumers will see them. In this capacity, the marketing department may be responsible for the creation of television ads. The public relations team, on the other hand, attempts to spread the word about a video game through the press and via the dissemination of promotional materials. These materials may include video game trailers and behind-the-scenes documentaries. Both the marketing and public relations teams are involved in the creation of videos that may occasionally need original music from the game composer.

Our contact with departments such as art, programming, design, public relations, and marketing will be limited and any requests made by these departments will be filtered through our primary liaison. We may not be aware that requests are coming from these departments, but each team will have needs specific to their disciplines, which will impact our work in various ways. The design team will have a strong influence on the preferred musical style of the game, with input from the art team. Programmers will make requests based on the music implementation plan, asking for everything from small technical adjustments to complete revisions. Public relations and marketing may make special requests as part of their outreach initiatives. We'll be exploring all of these needs more thoroughly in the next chapter.

Our Place within the Team

As game composers we'll need to remind ourselves frequently that we are members of the team regardless of the distances that may separate us from our coworkers. This fact may hit home during the project or it may sink in only after the game has reached store shelves. I always love meeting members of the game development team of a project I've worked on, but sometimes I'll only get the opportunity to meet these people after the project is over. I may receive an email out of the blue from an artist or a programmer letting me know what my music meant to them during their work. Other times I'll bump into a team member at an industry convention. We'll see each other's nametags and immediately begin reminiscing. It's amazing to me how quickly that sense of distance disappears as our conversation reveals that all throughout game development we'd been thinking the same thoughts, working toward the same goals, wrestling with the same frustrations, and celebrating the same victories. It doesn't matter that we might have been half a world away from each other. We'd shared a common experience and poured all our creative energies into a common goal. We had been members of a team.

9

Music Needs of the Game

Now that we're more familiar with the people who comprise the development team, let's take a look at how their music needs might progress, starting from the earliest days of a project.

The Pitch Trailer and the Vertical Slice

Unless we are in-house members of the team, we are usually not given the opportunity to significantly contribute to a game's development in its earliest phases. The sound and music professionals frequently sit on the sidelines while the team leaders from the art, programming, and design departments engage in the initial brainstorming process, and composers usually don't get to participate when the development team is creating the first embryonic incarnation of their game or when the team first pitches the concept of their game to prospective publishers. There is, however, a notable exception in which a game composer can make a significant contribution at this stage. If the development team has decided to prepare either a *pitch trailer* or a *vertical slice* as part of a publisher presentation, then the team may decide that original music is needed, requiring them to hire a composer. Writing music for a pitch trailer or a vertical slice is a great opportunity for a composer to offer a strong artistic contribution to a project in its earliest stages.

A pitch trailer, which is sometimes called an internal demo video or an internal trailer, is created solely for the purpose of selling the game concept to decision-making executives at game publishing companies. No one intends for this trailer to ever be released to the public. Why would a developer go to the trouble and expense of hiring a composer for something that will be seen by only a handful of people at most? They hire a composer because this handful of high-powered executives has the ability to green-light their project, and the developer will do whatever it takes to knock their socks off.

Since the game is at such an early stage, the pitch trailer may consist of little more than storyboard images and concept art knitted together to convey the basic bullet points of the game, or perhaps some gameplay capture taken from the only portion of the game that has reached a stage where gameplay looks presentable. The team hopes that a high-quality, impeccably produced musical score will elevate these visuals, endowing the entire presentation with a glossy sheen that says, "Here is a future blockbuster in the making." While the visual components may be somewhat rough, the musical score must be outstanding because it is delivering the sales pitch on an emotional level.

A vertical slice is a game level or area that has been completed in its entirety, including all programming, design, art, sound, and music elements. While the whole game may be a patchwork of rudimentary assets and empty spaces, the vertical slice should look, feel, and play like a finished game. To understand the term vertical slice better, imagine someone has decided to mix, bake and ice just one piece of a layer cake. The rest of the cake is still just a bag of flour and un-cracked eggs, but that one slice is very tasty.

For a vertical slice, a composer is hired to provide just enough music to make the gameplay experience feel natural and complete. The developer may request a single atmospheric track for exploration or menu navigation, along with a more energetic track for situations involving conflict. Since the gameplay experience in a vertical slice is invariably short, a modest amount of music will suffice.

Being hired to create music for a pitch trailer and/or a vertical slice presents a game composer with two terrific opportunities. The first is the chance to impress both the studio and the publisher at a very early stage in the game's development, which hopefully will lead them to offer a music contract for the full game. The second is that rare occasion in which a composer can impact the style and overall mood of a game when the core artistic direction is still malleable. In this circumstance, the composer can potentially make a contribution as significant as any of the

team leads.

Teaser Trailer

Once a project is given the go-ahead and received necessary funding, the team can begin earnest development on the project, including setting detailed production schedules for every department. As mentioned before, the creation of original music is usually scheduled to begin relatively late in the development cycle. However, the team may wish to hire a composer at an early stage if there is any plan to create an early trailer for release to the general public.

A *teaser trailer* is often used by the publisher as a vehicle to reveal the existence of a forthcoming game, hopefully kindling anticipation and interest from the gamer community. Like a pitch trailer, a teaser trailer is frequently created when there are few visual resources available from the actual game project. However, unlike a pitch trailer, a teaser trailer may use nothing at all from the game, either in terms of gameplay capture or art, and may instead present a series of enigmatic images meant to tickle the curiosity of gamers, capped off by the game's title logo. While some teaser trailers use licensed music, others feature original musical compositions. This is another opportunity for a game composer to set the tone for the game's musical score at a very early point in its development.

Experimental/Iterative Tracks

These tracks will never be labeled as such on a music asset list. They may not appear on an asset list at all, and may instead be requested individually at the very beginning of music production. It may not always be clear that the tracks requested are for either an *experimental*, investigational development strategy or an *iterative*, prototype-driven design method. However, it's a fairly safe bet that all game composers will be asked to deliver tracks of this kind for at least a few of their projects.

An experimental or iterative track is one that is requisitioned from the composer but may or may not be retained in the final game. Sometimes this track is for a segment of gameplay that was intended to be highly innovative but turns out to be too unstable or unpredictable. Sometimes the music is for an alternative version of a gameplay sequence that may be scrapped in favor of a previous or subsequent iteration. The team is most likely to request tracks for these types of purposes early in music production, when the game may still include tenuous sequences and areas.

Ideally, the developers should ask the composer to create music only for game sequences that are tried and proven. Still, enthusiasm for a particularly ambitious idea may lead members of the team to request music in order to present their ideas to the producer or creative director in the best possible light. If this sequence is cut from the game, the music is also likely to be cut as well. Most development studios will make sure that composers are compensated for their efforts on these tracks.

An experimental or iterative track may also be requested to test a system of music interactivity that may or may not be included in the final game. This is the trickiest situation when it comes to experimental or iterative tracks. Clearly, interactive music systems must be tested within the game, and not every proposed interactive system will be complementary to gameplay. The creation of interactive music (which we'll be discussing in chapters 11 and 12) is some of the most labor-intensive work that a game composer can undertake. Again, most studios will understand this, and will compensate composers for their time and effort (whether the music is used or not).

Global Tracks

We all know that the word "global" refers to something that pertains to the whole world. For our purposes, a *global track* is a piece of music that can be played anywhere in the game. Such music has no stylistic connection with any particular in-game site or event, and would be appropriate in any location or circumstance. These tracks tend to be heard most frequently and therefore are very important in defining the musical style of the game; they also have the greatest potential for causing listener fatigue through repetition. Both of these issues inspire game developers to ask for global tracks as early as possible so that they can be tested rigorously in-game and perfected. Frequently, global

tracks are the first pieces of music a developer will request. Any type of game music could conceivably be used in a global fashion, but there are three particular types that are often used this way.

A *stinger* (which we'll be discussing in more depth in the next chapter) is a short track, usually ten seconds or less, that is triggered when a specific event occurs. In order to be global, this event must happen repeatedly, regardless of the character's location or circumstances. Among the most common events that may be assigned a global stinger are:

- Player is victorious,

- Player is defeated or dies, and

- Player finds another in a series of collectible objects.

While these tend to be the most common events that are assigned a global stinger, any in-game occurrence that repeats with sufficient frequency can be assigned one, as long as the event is not location-specific.

A *menu track* is a piece of music triggered whenever the player activates a type of options list that temporarily pauses the action and simultaneously blocks the player's view of the game. Menu music tends to be subdued in order to allow the player to concentrate on making choices. In order to be global, a game menu must be freely accessible anywhere in the game. As an example, a global menu may allow a player to access rosters of available equipment and objects, as well as maps and journals that the player may have acquired. A global menu may also open the door to different types of gameplay, such as a menu in a racing game that enables a player to customize a car, or a menu in a role-playing game that lets a player combine different objects in order to create more valuable items for use or sale. As long as the menu can be accessed throughout the game, it can be considered global.

A minigame may also be considered global if it occurs repeatedly throughout the game. An example of this would be a puzzle-like game that is triggered whenever a player attempts to pick a lock. Such a minigame may be accompanied by a specific piece of music that would recur whenever the minigame is triggered.

The Main Theme

Often considered one of the most important tracks in a game, the main theme serves as a game's musical signature. It may have a strong melody designed to be memorable or it may be strongly evocative of a specific atmosphere that defines the game's overall experience. Either way, the main theme is invariably iconic. The best main themes can quickly summon vivid memories of gameplay long after a player has completed a game and set it aside.

Unlike a global track, the main theme is not used in multiple locations. Usually triggered at the very beginning of the game, the main theme does not tend to recur in its same state elsewhere. Nevertheless, the team may request the composition of the main theme early in development for a variety of reasons. This type of music can be incorporated into early game trailers, such as a teaser trailer (if the main theme is written early enough, and if the team does not intend to requisition a specific track for this purpose). Because the main theme is usually an encapsulated expression of the musical style that will define the rest of the score, the developers may request the main theme early on in order to nail down the game's musical approach before anything else is composed. In addition, the main theme may be commissioned while the developer is still preparing to pitch the game idea to publishers, with the idea that a vertical slice will seem more "complete" when it includes the main theme. Finally, because the main theme is often placed in the game's opening menu, it may be triggered whenever the game is launched. This creates the potential for the theme to be heard many times (if the player does not immediately skip past it to launch a saved game), in which case the team may request the main theme early so that they can be sure it does not become tiresome after numerous repetitions.

Tutorial Music

A tutorial is a section of the game, usually located near its beginning, that is meant to instruct the player in the game's controls, user interface, and/or mechanics. This section may present a series of simple text screens and animations used to demonstrate skills that the player will need in the rest of the game. Going beyond this modest approach, the tutorial may whisk players to a separate training area, where skills can be learned and practiced in a safe, consequence-free environment. In its most lavish expression, a tutorial may take the form of a full-blown

gameplay level complete with allies, enemies, and an unfolding storyline that blends seamlessly into the rest of the game.

Tutorial music can take many forms. If the tutorial is meant to stand apart, then its music may bear more in common with menu tracks that also temporarily separate the player from the action of the game. If the tutorial is constructed to flow into the main game as though it were the first gameplay level, then the music requirements may be identical to that of any other portion of the game. However, unlike a typical level, a tutorial level may be interrupted repeatedly by instructional assistance, and the player's mental state will be influenced by these interruptions. During the chapter on the concept of immersion, we discussed the power of music to alleviate those feelings of frustration that may arise when a player is learning a new skill. We should take this consideration into account when creating music for tutorial sections of the game.

The majority of tutorial music is encountered toward the beginning of the game, usually within the first level. In my experience, if the developers are requesting music submissions in a particular order, they will usually ask for the music of the first few levels to be delivered early in the music production schedule. There are several possible explanations for this. If the developer intends to create a playable demo (to submit to journalists or for dissemination online), such a demo usually features an early portion of the game that would need to be completed well in advance of the others. Also, the beginning of the game is its only chance to make a positive first impression, which may lead developers to spend extra time evaluating the effectiveness of those initial levels.

Action Tracks and Ambient Tracks

These are the meat and potatoes of a video game score, comprising the majority of work that we do as game composers. Found in nearly every video game genre from puzzle games to shooters, *action and ambient tracks* are designed to enhance two diametrically opposed states of gameplay.

Ambient tracks set the emotional atmosphere during lower energy periods in which the player is free to explore, engage in relatively safe activities, and interact with other characters (if there are any). From the gentle strumming of a lute in a medieval tavern to the ominous synthetic pulsing in a near-future city, ambient tracks establish a mood that adds layers of meaning to a game's environment. Generally speaking, alternative names for these tracks include *explore tracks*, *background tracks*, *environment tracks*, and *atmosphere tracks*, but there may be specific names depending on the game genre. For instance, in a puzzle game, such a track may reference whatever gameplay mode is most low-key (e.g., *relaxed mode* or *freeplay mode)*, whereas in a racing game, such music may reference the part of the game in which it is used (e.g., when studying a course *overview* before the race begins).

Action tracks stimulate the excitement level of the player during periods of heightened activity. From fast-paced platforming to relentless battle sequences, an action track is the means whereby the game communicates the intense emotions of the experience. Action tracks may be referred to by other names, depending on the game genre in which they occur. For instance, in an action-adventure style game, they may be referred to as *combat tracks* or *fight tracks,* but they may also be used in other action-oriented situations such as pursuits. A survival horror game may not characterize these pieces of music in terms of combat but instead refer to them as *chase tracks* (since the player would be running frantically away while the music was playing). In a racing game, these tracks would (quite logically) be called *racing tracks.* In a puzzle-style game, action tracks would likely bear the name of whatever high-energy mode triggers them, such as *time attack* or *challenge mode.*

We can't talk about action tracks without a brief mention of *boss tracks.* These pieces of music are especially intense action tracks intended to enhance a combat sequence with a particularly formidable foe. A game project may require only one such track for the "ultimate" encounter occurring at the end of the game, or it may need several if there are multiple *minibosses.* These are tough enemies, often situated at the end of a level, whose defeat allows the player to advance to the next portion of the game until they reach the last encounter with the ultimate foe. Boss tracks present the composer with the opportunity to create the most epic and bombastic music of the game. This can be both exciting and intimidating. If given the choice, I tend to leave the composition of such tracks until near the end of music production so that I can use the many themes that have already been established in the other tracks I've previously composed.

The bulk of a game composer's creative life is divided between ambient and action tracks, and while most games will require the creation of both types, there are some game projects that will need only one. For instance, some

fighting games or beat-em-ups may have no need of ambient tracks, and some puzzle games or lifestyle simulations may require no action tracks. In my experience, most projects entail the creation of both styles of music, with occasional exceptions.

Puzzle Tracks

This name may cause some confusion, as it suggests a connection with the puzzle game genre. However, in this discussion, a *puzzle track* is a piece of music that is triggered whenever the player is asked to solve a puzzle (no matter what the overall game genre happens to be). A more descriptive term for this type of music may be *mystery track*, since the musical style of puzzle tracks tends to emphasize the intrinsically mysterious nature of the puzzle and the intriguing process whereby the player will solve it. However, the term "puzzle track" is widely accepted in the industry, and I'm not aware of any variants for it.

A puzzle track can be either low-key or intense, depending on the nature of the puzzle. However, the stylistic approach rarely crosses into the realm of action music and concentrates instead on creating a mood that enhances the story and is conducive to the process of deep thought. That mood will depend on the stakes of the situation (i.e., music for defusing a bomb would be darker and edgier than music for opening a safe).

Genres such as action-adventure games may require lots of puzzle tracks while other genres (such as fighting games and shooters) may need few, or even none. However, given the pervasiveness of puzzle mechanics within a large variety of game genres, we will certainly find ourselves composing numerous puzzle tracks in the course of our careers as game composers.

Scripted Sequences, Cut Scenes, Quick Time Events, and Cinematics

We explored the concept of the cinematic briefly in chapter 7, but a short history of this concept will be helpful in order to understand its place in modern video game storytelling. Many video games feature an ongoing narrative, which is meant to give the gameplay a sense of structure and momentum. In the earliest video games, such stories were told with static images in which characters conversed in text-only dialogue bubbles accompanied by music. Over time, these sequences were replaced with full-motion video featuring computer-animated characters and voiced dialogue. These videos added an astonishing level of drama to the video game experience. At the height of their popularity, cinematics had become splashy, expensive mini-movies that told gripping stories with extravagant visual effects. Unfortunately, these movies often looked significantly different than the appearance of the game, and this could be disorienting to players. The movies also relegated the players to the role of passive observers, which became a source of frustration for some gamers who didn't like that feeling of disempowerment.

Now, game developers have invented several ways to keep players engaged during crucial storytelling moments in the game. Showy sequences of events can play out via the game engine, which is the core software framework that renders all environments and runs all activity in the game. Presenting such story-driven moments from within the game engine gives players the opportunity to change their position, look in whatever direction they please, and intervene in various ways. In a *scripted sequence,* a surprising event takes place that changes the parameters of gameplay but does not interrupt the game. A *cut scene* takes control temporarily away from the player so that a short scene can play out, but creates the visuals using the game engine so there is no break in visual continuity. A *quick time event* is essentially a series of cinematics that are broken by brief pauses in which the player is prompted to enter a button sequence, the success or failure of the sequence invoking different outcomes. Finally, traditional cinematics are still used heavily in video games, though not as pervasively as they have been in the past.

As we've previously discussed, music for these storytelling sequences will usually be requested last because such assets tend to be completed very late in the game development schedule. This can be advantageous, allowing us to invent and expound on our thematic material in other tracks so that our collection of themes is as fully developed as possible by the time these storytelling sequences are ready to be scored. While cinematics can be scored using the same techniques common to film and television composition, the other storytelling methods mentioned above may not proceed with predictable timings. In this case, a custom ambient track can be used for a cut scene. Scripted events and quick time events may require a more interactive approach (see the upcoming chapters on interactive music in games).

The Attract Mode

Not all games have an *attract mode*, and if music is required for such a mode, then that music may be one of the last tracks that the developer will request. The attract mode comes from the arcade days in video game history, when an arcade cabinet might stand idly for long periods between play sessions. During this time, the arcade game would alternate between a screen showing the game logo and a video displaying the game in action. This video was often constructed like a very demonstrative trailer, highlighting all the most explosive action moments in the hopes of attracting players. Nowadays, many games still feature attract modes that allow gamers to receive an enthusiastic preview of the gaming experience to come.

As an example, toward the end of music production on the *Speed Racer* video game, the producer asked me to create music for an elaborate attract mode featuring a montage of high-speed races on spectacular racetracks. It seemed clear to me that this was not the time to invent new musical themes. The visuals were a virtual medley of the racing experience offered by the game, so I created a literal medley of themes from the *Speed Racer* video game score. Like an overture for a work of musical theater, the music for the *Speed Racer* attract mode transitioned quickly from one theme to the next. The result turned out to be a very brisk and high-energy experience that worked well as a traditional attract mode. The publisher also released this video as a trailer prior to the release of the game, which brings us to the final music that may be requested at the end of the project.

Trailer Music

If we are asked at the end of the project to create original music for a game trailer or commercial, this request is likely to pertain to the marketing and public relations efforts of the publisher rather than the development work of the team. Sometimes, in the effort to orchestrate a buildup of excitement prior to the release of a game, a series of trailers or commercials are created. In many circumstances, these videos feature music already written for the game and do not require any new material. However, it is possible that the public relations and marketing departments will need us to supply new music for this purpose.

This music is not usually a part of our original job as composers for the game itself, and therefore requires a separate music agreement with its own terms and compensation. Composing the music for such a trailer can be very satisfying, especially at the end of the music production schedule when our personal enthusiasm for the project has reached its peak. We should be aware, however, that the oversight for such musical composition may diverge from that to which we've become accustomed. While our primary liaison may remain the same, the final judge of our music in this case will likely be in the public relations or marketing departments, and his or her taste may differ significantly from the musical preferences of the development team. We may need to make significant adjustments to our musical approach in order for our music to fit in successfully with a predefined marketing or promotional strategy.

The Role of Music in Games

Every publishing company and development studio will have a different idea about the role that music should play in a video game. This can lead to a great deal of variation from project to project, including the way that music is utilized in a game and the types and numbers of musical assets required. While this chapter has attempted to describe the kinds of music that may be included in a game project's asset list, there are always the possibilities of new types of tracks and new purposes for music in the field of interactive entertainment. In the next three chapters we'll discuss core compositional techniques that are employed by game composers for both linear and interactive game music formats. With these skills, we can prepare ourselves to adapt to any new challenges that the future may hold for us.

10

Linear Music in Games

There is a debate currently raging in the world of video games. The debate concerns whether games can ever truly be considered "art." Many professionals in our industry think that games have already achieved that lofty summit whereby a work of ingenious craftsmanship becomes emotionally powerful enough to be hailed as art. Not everyone agrees, however. The most vocal among these naysayers was late film critic Roger Ebert, and one of his chief arguments against the viability of video games as art was the variability of the experience. "Art seeks to lead you to an inevitable conclusion, not a smorgasbord of choices," Ebert (2007) writes.

We'll be discussing Ebert's views in more depth later in the book. For now, let's set aside the issue of the intrinsic artistic worth of games and instead consider Ebert's statement as a fairly succinct definition of what differentiates a *linear* and a *nonlinear* experience. A linear (or non-interactive) experience seeks to lead the player to an inevitable conclusion. A nonlinear (or interactive) experience presents the player with a smorgasbord of choices. Despite what Ebert asserted, both linear and nonlinear experiences are to be found abundantly in video games, offering players the chance to partake in deeply emotional journeys and explore worlds of dazzling complexity. Many games contain both gameplay types; others feature either one or the other. For instance, games in the *Half Life* and *Call of Duty* series are known for a compelling linear structure wherein the player defeats enemies in order to unlock an all-encompassing storyline that barrels toward a spectacular conclusion. In contrast, games in the *Fallout* and *Elder Scrolls* series are built around a nonlinear structure that offers players enormous landscapes and a huge assortment of choices, resulting in numerous divergent paths for gameplay and exploration.

Linear and nonlinear mechanics are part of a game's core design philosophy and are therefore most important to the members of the design team, who write the game's storyline and devise its missions and objectives. As game composers, we may imagine that these design-driven concepts will not have a direct bearing on our work. Yet, we know how powerful music can be in the communication of story, lending emotional weight to concepts and characters and helping in the attainment of immersion. Perhaps because of the intrinsic partnership between story and music, the concepts of linear and nonlinear construction have filtered into the realm of music composition for games. Though the terms do not carry the exact same meaning when applied to our discipline, there are many parallels between linear and nonlinear mechanics in design and in music composition.

Nonlinear music has the capability to change based on the state of the game and the choices of the player, creating variations that are determined by the player's actions. Just as a nonlinear gameplay mechanic adjusts itself to the choices of the player, a nonlinear musical composition adjusts itself to the state of gameplay. In contrast, linear music in games consists of compositions that exist in a fixed form within the medium of time—that is, the works are composed with a set musical structure that does not change as the music plays and as time passes. Like a linear game narrative that unfolds with a preordained sequence of events, a linear piece of game music plays with a planned compositional structure that does not alter.

In this chapter we'll be discussing the three basic components of linear music in games: *linear loops*, *stingers*, and *one-shots*. Let's start with the linear loop.

The Linear Loop

Imagine that we're walking together through the forest, following a gently curving wooded path. It's a pleasant day. The scenery includes an attractive display of trees and flowers in charming arrangements that meld together into a unified expression of loveliness. As we walk, we're enjoying a lively conversation that is consuming our attention. Because of this, it takes a long while before we notice something odd about our walk. Finally we slow down, look around, and realize we've been walking on a circular path that has been repeatedly returning us to where we

started.

This is the analogy that comes to my mind most often when I think of the concept of the loop in linear game music. A loop is like that gently curving path. It takes the listener on a journey that is interesting enough and diverting enough to disguise the fact that it has repeated. When a loop is composed expertly, this disguise can remain effective through many repetitions.

There is a distinctive art to the composition of such a loop, for which traditional music composition training cannot adequately prepare us. In many ways, the integral philosophy of traditional music composition is in direct opposition to the demands of linear composition for games. For instance, in describing the process of constructing an effective musical work, composer Aaron Copland writes, "The composition must have a beginning, a middle, and an end; and it is up to the composer to see to it that the listener always has some sense of where he is in relation to beginning, middle, and end" (1939, 26). This may be sound advice for traditional music composition. For a loop in a video game, however, Copland's philosophy is out of place. A loop of music that signaled to the listener its current position (beginning, middle, or end) would become horrendously tedious as it repeated. To continue our previous analogy, when walking along our gently curving path through the forest, those musical "signals" would become like attention-grabbing landmarks in the forest, alerting us immediately to the fact that we are walking in circles.

Because music composition in loop structure can be so difficult, there are many opportunities to hear examples of unsuccessful music loops within video games, both from the early history of the medium and in modern day releases. This has led some developers to take dramatic steps to ensure that music loops do not alert listeners to their repetitive nature. Prevalent strategies include the use of music loops that lack any noticeable melodic content, and music with such a strictly uniform and unchanging content that there is nothing present that might register with a listener's conscious awareness. These choices, though safe, also pose a significant risk of blandness. There are many other possible strategies for creating effective music that loops.

As game composers, our concerns about loop composition may be quite different from those of the development team. For us, one of the most daunting challenges is posed by the task of composing music that has no beginning, no middle, and no end. Like writing a sentence without punctuation or capitalization, composing expressive and communicative music without a beginning, middle, and end creates significant problems. We may be afraid that our music, bereft of structure, will seem to aimlessly meander in a bewildered state of amnesia, having neither an origin nor a destination. Yet, powerfully expressive music can be written for this format.

The Art of the Linear Loop

For my game projects, I've employed quite a few methods for composing music that is meant to play repeatedly. Particularly in the *Spore Hero* project for Electronic Arts, I had the opportunity to experiment with a few techniques that are of interest to us here. These techniques for loop composition include:

- Perpetual development
- Compositional dynamics
- Succession of variations
- Repeating figures
- Slow textures

Some of these methods are in common usage in the field of video game composition, and others are techniques that I have developed and employed in my own projects. All offer useful problem-solving approaches for the creation of effective loops.

Perpetual Development

While at first glance this may appear to be a phrase pertaining to a very long game development schedule, the word *development* has a dramatically different meaning when taken strictly in the context of our profession as composers. In music creation, development is defined as an elaboration of the structural content in a piece of music, most commonly its melody. Using various techniques, a composer seeks to imaginatively explore the possibilities presented by the original theme. In this way, development is separated from the concept of *variation,* in which such content is presented in a single alternative form that may be deliberately set apart from its original version. While a variation often asserts its distinct identity in a definitive way, a melody in development may rise naturally from the original source—like a new green shoot springing up and growing from the trunk of the original tree. Using

development, a composer can seemingly "spin out" an original melody, allowing it to grow and transform in a fluid and apparently spontaneous fashion from its original state.

The advantage presented to us by the development technique is one of seamlessness and organic change, wherein a melody transforms by degrees over time, taking on new shades of identity. Unlike the variation technique, a melody in the process of development may present itself as a series of continuous transformations rising out of the original form, perhaps temporarily resuming it, and then spiraling out of it again in new directions. Returning to our previous metaphor, as we walk down that gently curving path, a melody in perpetual development will seem like a veil of ornately growing ivy that rises up on either side, always interesting and varied in shape and texture and yet always presenting a single identity.

There are many examples of lengthy thematic development to be found in the history of musical composition, from the contrapuntal intricacies of Johann Sebastian Bach to the melodic romanticism of Franz Schubert. While melody is frequently identified with such development, other compositional elements can also be "spun out" with multiple elaborations, including chord progressions and rhythmic patterns. Some interesting examples of this come from the minimalist and post-minimalist schools of composition, including the works of Steve Reich and John Adams.

Figure 10.1
The beginning of the fugue section from Johann Sebastian Bach's "Toccata and Fugue in D Minor." This piece of music demonstrates lengthy thematic development.

In *Spore Hero,* I had the opportunity to create several tracks structured around this idea of continuous thematic development, and I found that one of the best advantages of this technique is its lack of dependency on a traditional song structure. In fact, song structure may be a form best avoided by game composers because it is defined by a sectional approach that emphasizes clearly recognizable patterns of repetition. While we should certainly feel free to allow our melodies to return within the confines of a single composition, we should try to make them sound distinguishably unique. Melodic recurrences that are too similar to the original statement only compound the sensation of repetition we have been trying to avoid. A distinctly recognizable "chorus" that returns in its original state also has the potential to become an attention-grabbing landmark along the curving path, further drawing notice to the fact that the walk is proceeding in circles.

Another advantage of this technique (and of the other techniques I'll be discussing in this section) is the strong impression of constant change that the music will convey to the listener. Composing linear music for the inherently interactive experience of a video game is radically different than composing linear music for film or TV—in a game we do not have the luxury of knowing what will happen from moment to moment. The best we can do is surmise that change will undoubtedly be occurring as the player progresses and that many activities will be taking place. Knowing this, we can instill in our music a sense of continuous change so that the composition as a whole will mirror the experience of gameplay. In this way, our music will better complement the action.

Compositional Dynamics

Dynamics in music theory are typically interpreted as indications of auditory volume; for example, a marking of *fortissimo* indicates a very loud musical passage and a marking of *pianissimo* a very soft one. However, for the purposes of our discussion of techniques for the composition of linear music loops for games, let's consider the more general meaning of the word. Dynamics can mean either "forceful and energetic" or "pertaining to motion." It is this second definition that chiefly concerns us here.

Let's again imagine that we are walking along that gently curving path through the forest, except now let's picture a setting that includes weather and wildlife. Breezes cause the treetops to sway. A squirrel runs across a branch. Overhead, an eagle rides the wind, and gnats swarm busily in the distance. All of these things blend together to form a lively environment, yet no particular movement forces our attention away from our walk and our continuing conversation.

Music that attempts to create this effect of movement can be very successful within a linear loop. For the purposes of this discussion, let's refer to this method as *compositional dynamics*. It is based on the idea of a string of small musical events. Each one evokes a sensation of movement and then logically transitions into the next small event. No particular event exceeds the others, although there can be an ebb and flow of intensity. The impression of movement can be accomplished in many ways, depending on the musical genre. Techniques can range from melodic fragments, runs, and ornaments in an orchestral ensemble to synthetic and sound design–inspired flourishes in an electronic composition.

While composing in this manner does not preclude the idea of thematic content, satisfying compositions can be created without themes. The key to achieving a pleasing result lies in paying very close attention to the transitions between these moments of activity, ensuring that all musical events logically rise from their circumstances and do not make overtly surprising appearances. Any such surprises will inevitably become landmarks on the curving path.

For examples of the compositional dynamics technique we need look no further than the music scores of the *Star Wars* franchise, whether they are incorporated into the film, television, or video game incarnations. In fact, listening to the music of such video games as *Star Wars: The Force Unleashed* and *Kinect Star Wars* from LucasArts can be extremely helpful to us in learning to compose music that exhibits a constant state of frenetic activity and movement. The musical style of these games tends to feature frequent dynamic changes and rapid-fire flourishes that meld with the visual style of the action-packed franchise. Because the energetic musical activity accentuates the hectic movement in-game, the compositional style is particularly appropriate for music loops meant to accompany action. However, for use in projects not as action-packed as a *Star Wars* game, the compositional dynamics technique can be slowed down so that the dynamic changes and flourishes occur with a nimble and lighthearted gentleness that can be very effective for ambient music, as well. I have used this technique many times in my own work, from the whimsical action loops in *Spore Hero,* to the surreal ambient loops of *SimAnimals,* to the madcap combat loops of *Shrek the Third.*

Figure 10.2
Excerpt from a piano reduction of "Grassy Glen" from the *SimAnimals* orchestral score. Rapid flourishes illustrate the technique of *compositional dynamics*.

Succession of Variations

This technique will only work effectively with a lengthy loop of five minutes or more and should not be attempted with a short loop. As the name suggests, this compositional technique involves the development of one or more themes in several successive variants. However, there is a particular psychology at work in this technique when it is used within the framework of a linear loop.

Returning to our metaphor of a walk in the forest, let's imagine that while we are walking we see a rare species of lizard clutching a vine overhead. Soon after, we see a great and ancient oak whose gnarly branches clutch at the sky. After this, we catch a glimpse of a slow-moving brook, the water dark and shimmering. Moving on, we see an overhang of rock whose stark shadows fall across weird mushrooms. For what seems a long time, these spectacles continue to appear, one after another and each quite different than the one before so that our minds are

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subconsciously impressed with the highly variable environment. Our walk proceeds, and all the while we continue our conversation. By the time we have physically returned to our point of origin, we have seen so many sights of such a highly inconstant nature that when we see the lizard again we do not immediately remember it and walk by without mentally acknowledging it. Likewise, the gnarled tree does not directly register with us as we pass, and so on.

A *succession of variations* in a linear loop of this kind would include significant changes in key, tempo, and style. Each musical variation would flow carefully out of the one that preceded it, the key changes prepared with logical chord progressions and the meter changes executed with gentle shifts in rhythmic emphasis. When painstakingly composed, a track of this nature would give the impression of taking a musical tour of a highly interesting landscape. Most important, because the track would have the capacity to include so many different expressions of thematic material, it would subtly overload the listener, causing the sections to blend together in the mind and become less readily recognizable.

While it may seem counterintuitive to build such fundamental changes into a single piece of music, it can actually feel quite liberating for the composer and can create opportunities for innovative expression. The technique works only with a loop of significant length, however. Five minutes would be the minimum length at which such a loop could successfully function, and longer than this would be even better. Unfortunately, developers do not always have the option to requisition music loops of this length, so it can be difficult to find examples of this technique used in the loop format.

In the *World of Warcraft* MMORPG from Blizzard Entertainment, the music composition team employed the succession of variants technique in a number of their linear music compositions. For instance, in the Dun Morogh mountains, we'll hear contrasting musical sections connected with transitions. This allows the music to seemingly drift from one divergent texture to another, exploring a thematic idea for a period of time before setting it aside to pursue a very different one. The construction of the music diverges slightly from the looping concept in that the music is instead separated into many sizable segments that are played consecutively in a manner similar to a playlist. However, the core musical concept remains the same and the succession of variations linear composition method enables this music to retain its freshness through many repetitions.

Personally, I had the chance to compose several tracks with this technique for the *Spore Hero* project, since that project included generous track lengths that accommodated this approach. For instance, in one of the game's early levels, the player has the opportunity to explore "Mushroom Valley," a friendly environment featuring whimsical characters and endearing quests. I composed a lengthy track for this gameplay sequence, intending to instill the variety necessary to avoid repetition fatigue. Since the game is set on an alien world full of bizarre creatures whose interactions mirror a tribal culture, I chose to explore various genres of world music. In keeping with the alien nature of the setting, I allowed lots of disparate ethnic instruments and performance techniques to interact with each other in unusual ways. I structured the piece as a musical journey in which the track visited various exotic ports of call, one at a time. This created a highly varied piece that bore up well under repetitions.
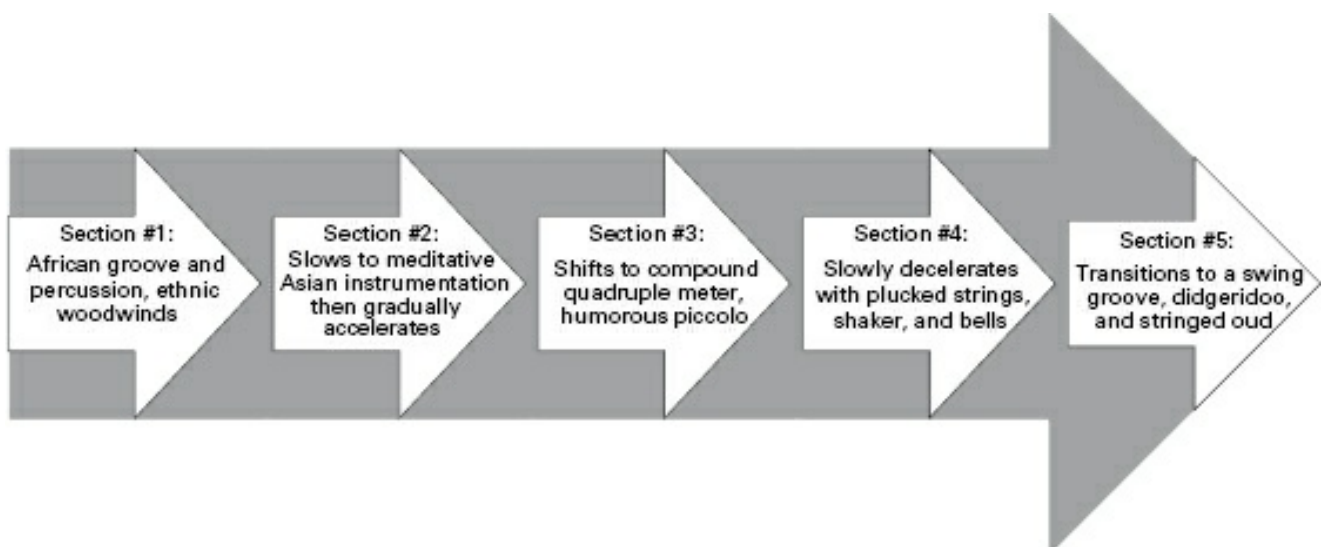
Figure 10.3
Flow chart depicting the construction of the "Sporexplore" track from *Spore Hero*.

Repeating Figures

This method entails the construction of a musical loop around a single structural element such as a melodic fragment, a tone pattern, a bass line, or a recurring rhythm, with the key and chord progressions fixed around a single root note that does not change. Melody may be juxtaposed with this structure or it may be omitted entirely. This tried-and-true technique is frequently used in modern video games. Its popularity may be driven by the theory that when a piece of music does not change significantly over the course of its length, it can then loop repeatedly without attracting attention from the listener. I have employed this method for very short loops (sixty seconds or less). Since the *repeating figure* method is not likely to create "landmarks" that would alert listeners to the looping nature of the work, it is especially useful for short loops that will probably be heard a great many times. With longer pieces of music, the inherently repetitive nature of the composition may be less effective at disguising the cyclic nature of the loop.

Slow Textures

This method involves the creation of either chords or tone clusters that gently swell and fade. These swells and fades typically happen quite slowly, allowing each chord or cluster to transition gradually to the next. Such a musical composition does not usually feature melodies prominently, although fragments of melody may float in and out. Blending well with environmental sound effects, these tracks are highly ambient in nature. Because this technique may occasionally give the impression that the musical content is somewhat sparse, players may at times either fail to notice the music or register it only at the outskirts of their conscious awareness. As a result, such tracks can repeat many times without annoying the player. This can be highly desirable when attempting to create a mood, particularly when the prevailing emotion is at the darker end of the spectrum.

One game score that employs this technique effectively within both a linear and nonlinear context is Austin Wintory's *Journey* soundtrack from Sony Computer Entertainment America. Earning the first-ever Grammy nomination for a video game score in 2013, *Journey* proved that the *slow textures* musical technique could have a strong impact when combined with a deeply atmospheric and emotionally moving gameplay experience. In order to effectively incorporate live musicians (whose performances would be essentially linear), the score includes both linear and nonlinear pieces of music (Stuart 2012). The prevalent musical style consists of warm synthetic chords moving very slowly over a constant base tone, punctuated by solemn bells, airy high-pitched synths, and subtle melody fragments performed by live instruments such as the cello and bass flute.

Figure 10.4
Excerpt from the cello solo that begins the "Nascence" track from the video game *Journey.*

The slow texture method is frequently encountered within modern video game scores. I have created music of this kind for several projects. Executing the chords or clusters with symphonic choir can give the overall effect a warm, human presence that lends these tracks more inherent musicality, as well as a haunting atmosphere. Alternatively, a more synthetic, sound design–influenced approach will work well for tracks that are darker or more futuristic. In projects ranging from *The Da Vinci Code* to *God of War,* this technique has helped me in the effort to create a mesmerizing musical atmosphere.

In addition to the five methods that we have just discussed, there are certainly many other possible strategies that

may occur to us when we are involved in the creation of musical loops for video games. When considering such strategies, we must assess what can realistically be achieved in the amount of time afforded us by the requested track length, and the impact that repetition will have on the musical content of the loop. Experimentation can yield many pleasing results, giving a composer the chance for personal expression within a technically demanding format.

The Craft of the Linear Loop

Now that we have explored some artistic considerations in regard to loop creation, let's examine some of the more practical concerns. How does a composer plan and execute the logistical construction of a piece of music that is designed to endlessly repeat? Traditional linear composition is built on either an escalation to a climax or a diminishment to a denouement. Neither of these will work in a linear loop. To create a successful looping composition for games, one key principle must be kept in mind:

A looping composition must end the same way it began.

In other words, if our composition begins with an ensemble of quietly plucked strings, then it must end with that same plucked string orchestra, performed at the same volume and tempo. Since the end of the loop will be carried around to conjoin seamlessly with the beginning, we can consider these opposite ends of the composition to be two halves of one musical section. When butted against each other, it should seem as if the beginning and ending are simply long lost lovers, happily reunited. The seam between the ending of the loop and the return to its beginning can be referred to as its *loop point.*

There are several ways to make a loop point both musically satisfying and smoothly functional, and I've given them the following descriptive names for the sake of convenience:

- Vamp

- Answer-question format

- Identical phrase

- Interrupted progression

- Loop point flourish

Let's discuss some of the tactics that can help us to disguise the loop point and smooth the transition between the ending and the beginning of a looping track.

Vamp

In this technique, we construct a looping piece so that it begins with a section that repeats some rhythmic or chordal pattern. This pattern (typically not featuring a melody) may be characterized as a *vamp*, which is defined as a musical background that repeats as needed. In this case, we want the vamp to repeat very briefly only at the beginning of the piece. Then, we can compose the end of the piece so that it returns to the same vamp from which it began. The drawback to this method is that such a vamp may possibly be noticed as a landmark. We can combat this by inserting similar "vamping" sections periodically throughout the piece. These regularly spaced appearances will no longer seem particularly noticeable to the listener.

Figure 10.5

Chord-based vamp designed to repeat at both the beginning and end of a loop.

Answer-Question Format

Another solution to the loop point problem can be found in the use of *consequence-antecedent*, which can also be called the *answer-question* format. In melodic composition, the "question" is a term used to identify the first half of a melodic passage that usually ends with a sense of unresolved anticipation. The "answer" is the second half of the passage, providing resolution to the first half and a sense of closure to the melodic phrase. For instance, in the "Old MacDonald" nursery rhyme, the melody of the first sung phrase ("Old MacDonald had a farm") would be considered the question, and the second sung phrase ("Ee-Eye-Ee-Eye-Oh!") would be its answer.

When composing a loop using an *answer-question* format, we begin the track with the answer ("Ee-Eye-Ee-Eye-Oh!"), which in this context may give the impression of an introductory melodic fragment leading us into the main body of the piece. Then, when we have reached the end of the musical work, we state the question ("Old MacDonald had a farm"). This will lead us smoothly back to the beginning of the piece, where the answer ("Ee-Eye-Ee-Eye-Oh!") will flow logically out of the question, thus completing the melodic passage in a very satisfying way.

Figure 10.6
The answer-question technique demonstrated with the "Old MacDonald" melody.

Identical Phrase

A third solution to the loop point problem is the *identical phrase*. In music composition, sometimes it is very desirable to repeat a melodic phrase twice for emphasis. Using another nursery rhyme as an example, we can see the identical phrase construction in the melody of "Three Blind Mice," which repeats many phrases identically within the body of the song.

Figure 10.7
The identical phrase technique demonstrated with the "Three Blind Mice" melody.

In such a structure, the identical phrases balance each other. Using this technique as a solution to the loop point problem shares some similarities with the *answer-question* format, in which we separate two halves of a melodic phrase and place them at opposite ends of the piece. In the case of the identical phrase, we separate the two repetitions, placing one at the beginning of the loop and the other at the end. When stated alone, the single phrase at the beginning will feel introductory, but when joined with its identical twin at the end, the two phrases will disguise

the loop point beautifully while serving their original purpose.

Interrupted Progression

Moving on to another tactic, we all know that a *progression* is a series of chords creating a sense of movement and change within a musical work. The progression may build to a significant key change, a shift in the overall dynamics of the piece, or the statement of a new theme or motif. In the *interrupted progression,* this series of chords is sliced down the middle. The first half of the progression ends the piece and the second half begins it. Just as in previous methods, the progression that begins the piece will feel introductory when first stated but will join logically with the chord series at the end of the loop, ultimately presenting itself as one uninterrupted progression.

Figure 10.8
A general example of the interrupted progression technique.

With this technique, it is advisable to construct the progression with each chord playing more than once before moving to the next because it will help to solve a technical issue associated with loop point editing (more on this in the upcoming technical section).

Loop Point Flourish

It is possible to solve the loop point problem without halving any phrases, progressions, melodies, or vamps. Using a dramatic build at the end of the loop, we can create a sense of anticipation that is answered by a *loop point flourish.* The theatrical, perhaps explosive burst at the beginning of the track will effectively mask the loop point, and the build at the end of the loop will prepare the listener for the oncoming musical eruption that will occur when the loop returns to the beginning. One drawback is the danger of this flourish being perceived as a clear landmark, which makes it important to construct the track so that other similar bursts occur elsewhere within it.

Figure 10.9
A general example of the loop point flourish technique in action, which dramatically masks the loop.

Technical Issues with Loop Construction

Now that we've explored some creative and logistical issues associated with loops, let's talk about purely technical

problems that may arise. Preparing an audio file to loop smoothly isn't always a simple task, and there are two issues that may cause consternation in the loop editing process:

- Reverb tail
- Zero crossing point

Let's tackle these issues one at a time.

Reverb Tail

As we've discussed previously, a linear loop must end the same way it begins. On a technical level, this means that the audio content in the final split second of the loop should perfectly match the audio content in the beginning split second of the loop. We want these matching bookends because they compensate for the loop's "tail," which is the time it takes for the last sonic event of the loop to fade away to silence. Sometimes this is called a *decay envelope* because the concept focuses on how a sound decays over time, or it may also be called a *reverb tail* because the reverberation in the original recording (or any artificial reverb we may have subsequently applied) will usually be the last thing we hear when the final note ends.
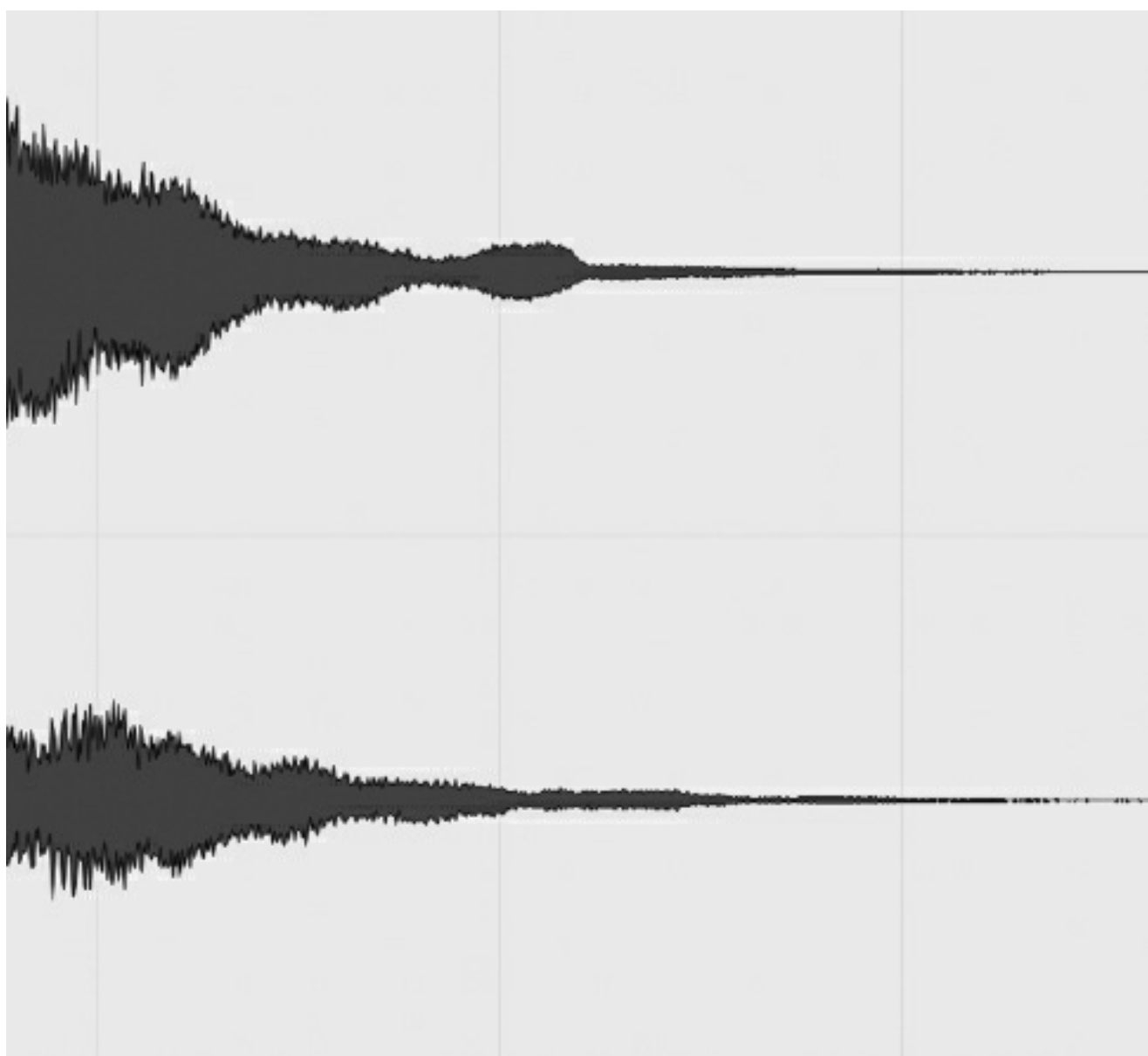
Figure 10.10
A waveform showing the decay of a sound, commonly called its reverb tail.

The reverb tail is a sticky issue in loop editing. Simply chopping off the reverb tail at the loop point usually isn't a

good solution. As human beings, we're remarkably sensitive to fine details in audio content, and even in a very busy musical passage, we may still sense the subtle artificiality that would occur when the reverb we've come to expect is momentarily absent at the loop point. It is always better to let the reverb ring out naturally. When we trim the ending of our loop (in our preferred multi-track audio software), we should copy the reverb tail at the end and paste it into a new audio channel at the beginning of the loop so that the reverb tail can play at the start of the piece. This allows the reverb tail from the ending to overlap with the beginning so that we never sense any sudden absence of reverb.

Now we come to the reason why we want to bookend a looping track with identical note pitches and instrumentation: if the last note of the loop does not match the first, then the overlapping reverb tail will create a sense of inexplicable dissonance and incongruity when the loop first begins. We normally don't notice the sorts of momentary dissonances created by reverb because our minds can identify the source that created the reverb tail and this allows us to mentally sort things out. When playing a loop for the first time with a dissonant reverb tail overlapping the beginning note, we can't identify what produced that reverberation and we perceive the result as very unpleasant.

Ensuring that the notes at the beginning and end of a loop are identical in pitch and instrumentation can solve this problem, but doing this can pose a few tricky issues. Returning to nursery rhymes as convenient examples, let's use the simple melody from "*Frère Jacques*" ("Are you sleeping, Brother John?") to illustrate the point. We can easily hear that the first "*Frère Jacques*" ends on the same note on which the second "*Frère Jacques*" begins. If the loop ends after the first "*Frère Jacques*" and then begins with the second, the loop point will be bookended by two identical notes.

Figure 10.11
A simple loop based on the "*Frère Jacques*" melody.

Depending on how much reverb has been applied, this may enable us to create a smoothly edited loop point. I mention the degree of reverb because in our hypothetical "*Frère Jacques*" loop, the amount of reverberation may create problems. If the recording is relatively dry or the size of the room relatively small, then we can be reasonably confident that our "*Frère Jacques*" loop will work perfectly. However, if the reverb is more pronounced, we may find the reverb tail of the second-to-last note of the "*Frère Jacques*" phrase bleeding over into the beginning of the loop. In this case, that note is the major third above the root. This reverb tail would give the momentary impression that the first note of the loop is in fact a two-note chord comprised of the root and the major third. We'll need to make adjustments to prevent this sort of unintended overlap from occurring. These adjustments can be made either during composition or in the editing stage but it is always preferable to think of these issues as early in the process as possible, since this planning tends to reflect well in the final results.

Zero Crossing Point

Those of us who have already edited short audio loops for use as building blocks in our musical compositions will be thoroughly familiar with the *zero crossing point*, but for the rest, a brief mention is in order.

We all know that when working with an audio file in our preferred multi-track software, we have the ability to view the audio data as a *waveform*. We can zoom in on this waveform until its blotchy, jagged horizontal shape transforms into a single line zipping up and down along a path from left to right. As it leaps up and down, the line frequently crosses the precise center of the waveform, which is the zero decibel point on the horizontal axis, also known as its zero crossing point. If the audio in question is in stereo, then we will see two waveforms running parallel to each other, each zipping back and forth over their individual zero crossing points. Their routes over the zero crossing point will rarely be uniformly symmetrical.
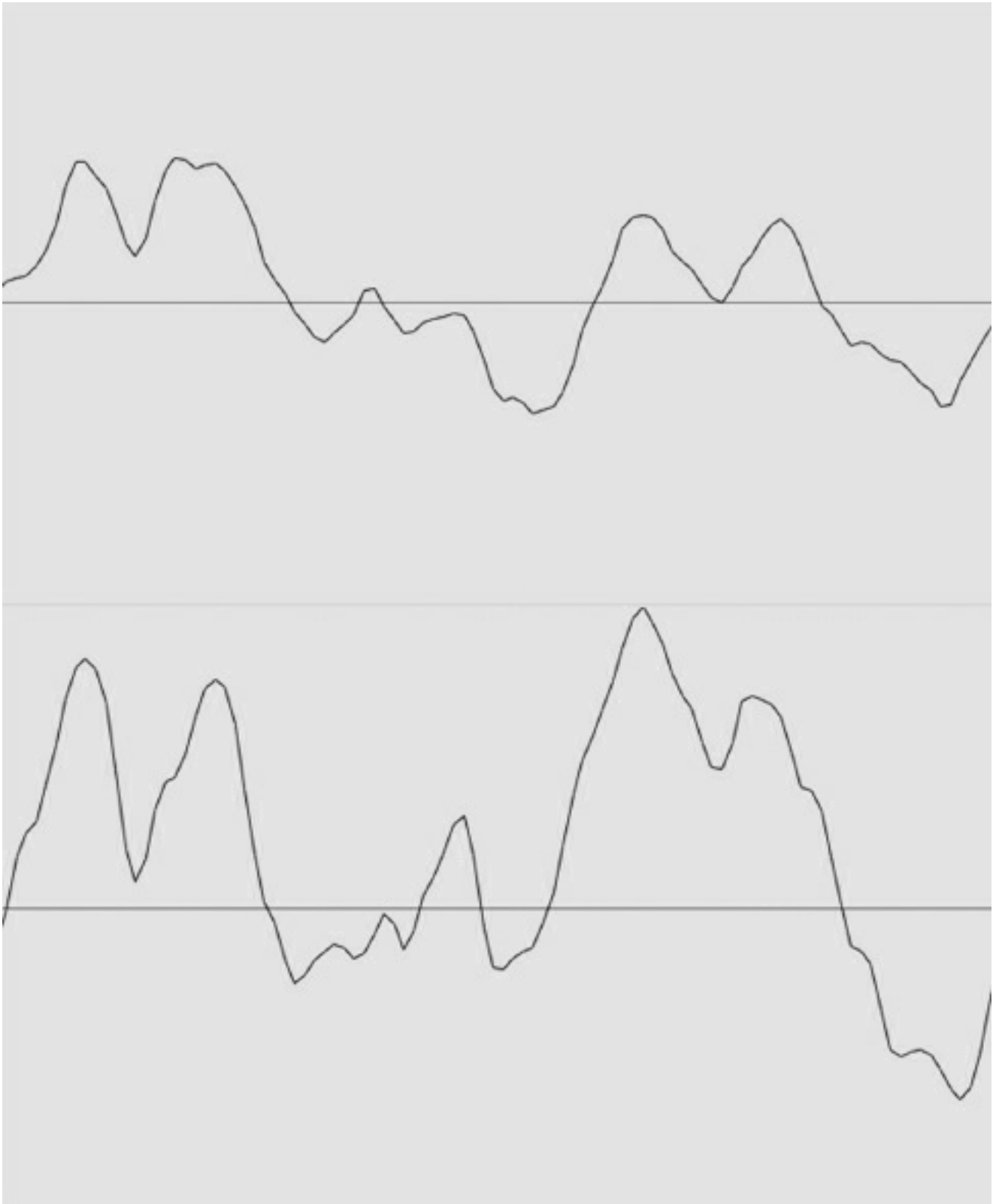
Figure 10.12
A stereo waveform illustrating the zero crossing point.

In order to create a beautifully seamless linear loop, the audio edits should occur when the waveforms are both passing simultaneously over their zero crossing points. Sometimes it can be very difficult to locate an instance where both the left and right channels are precisely situated on the zero crossing point at the exact same time, in which case we may need to settle for "close enough." To correct for this, we can create tiny fade-outs at both the beginning and ending of the loop in order to force the waveforms to cross the zero point. The fades should be only a few samples in duration. We may need to embark on a bit of trial-and-error before we are able to make the loop point perfectly seamless. There are also dedicated audio editor applications that feature special loop-crossfading capabilities (which can come in handy when we are struggling with a particularly difficult loop point). Generally

speaking, a rhythmic track will usually be easier to loop. The definitive downbeats of a track with heavy rhythm afford us loop points that are generally easier and quicker to edit. In contrast, ambient tracks with lots of floaty, elongated elements can sometimes be difficult to seamlessly loop. When I resort to using my own supplementary audio editor for the creation of loop crossfades, I usually do so for particularly pesky ambient tracks.

Final Thoughts about Linear Loops

Poorly composed, poorly structured loops can be immensely irritating. For instance, a short track that loops many times and repeats several obvious musical landmarks before it is interrupted is an example of a worst-case scenario when it comes to video game loops. Ideally, most linear loops should be lengthy musical compositions. They should be composed carefully, avoiding the inclusion of landmarks that may unnecessarily alert the listener to repetitions. Finally, no musical track in a video game should be overused, whether that track is written as a linear loop or not. The best video game scores feature many tracks of a substantial length that are composed to enhance the player's experience within the game.

Video games tend to offer gameplay experiences that last many hours, and developers are constantly striving to offer original content throughout the entire length of their games so that they will remain consistently entertaining from beginning to end. Music should be considered in the same light; therefore, more music is always better than less. More music in a video game serves to keep a player engaged via the continual introduction of novel and affecting compositions. More music tracks may also ensure that the music is more responsive to the state of the game at any given time by providing the developer with ample options when choosing which tracks should be triggered under which circumstances. When looking at the proposed music budget, the first priority of the development team should be to ensure that there is enough music to provide a satisfying experience for the player. In doing so, the developer can potentially avoid whatever listener fatigue may occur from the excessive repetition of any single musical work.

The Stinger

Now we come to the second major element of linear game music composition, the stinger. As previously discussed, stingers are short pieces of music usually ranging in length from two or three seconds at their shortest to fifteen or twenty seconds at their longest. The primary purpose of a stinger is to alert the player to a change in the current state of gameplay. Stingers are therefore designed to trigger in response to specific events. Above all, our goal as game composers will be to create stingers that feel intimately connected with the rest of the game score, rising out of the general music texture that has characterized the whole game.

Depending on the nature of the project and the music plan of the developer, a video game may have very few stingers (or none at all) or it may require dozens and dozens of stingers serving a wide variety of purposes. We'll examine a practical application of stingers after looking at a brief description of each of the following stinger types:

- Victory stinger

- Defeat/death stinger

- Transition stinger

- Hint stinger

- Prize stinger

While we certainly won't encounter all these varieties of stingers in a single project, we will surely compose them all (and others as well) throughout the course of our careers.

Victory Stinger

A good and simple comparison for the victory stinger would be the moment in which a person accomplishes something and then triumphantly sings, "*Ta da!!*" This is the essence of the victory stinger: it quickly announces that the player has achieved something special.

One of the most common uses of the victory stinger is the celebration of success after a player defeats an adversary at the end of a combat sequence. In this case, the victory stinger is inextricably connected to that particular piece of combat music and will only be used in connection with it. Moreover, the stinger will be composed

with the same musical instrumentation, in the same tempo, and possibly touching on the same thematic material that characterizes the combat track. This is because such a victory stinger will be triggered immediately on the player's triumph, superseding the combat track so quickly that it is likely to be perceived as a part of the combat music. For this reason, the stinger and the combat track must be complementary to each other and should not clash or feel unrelated. Victory stingers can also be used when puzzles are solved, platforming sequences are successfully navigated, or when any significant gameplay obstacle is overcome.

The victory stinger should state its musical message quickly and assertively. There is an art to creating such a triumphant stinger and it only comes through practice. In any other traditional method of music composition, an expression of supreme joy and pride will happen only at the end of a long, dramatic buildup of tension that yearns toward its inevitable release when the musical work metaphorically shouts, "*Victory!*" But in a stinger, that shout must come from nowhere, out of the blue. An inexpertly composed victory stinger may feel over the top or even ridiculous. On the other hand, a thoughtfully composed victory stinger can be powerful and vividly memorable.

I've created plenty of victory stingers as part of the video game scores I've composed in my career. From intimate and adorable stingers for *SimAnimals* to large-scale choral stingers for *God of War*, I've approached each stinger track as a separate and distinct challenge. However brief they may be, the composition of a victory stinger can be deviously challenging. If the stinger is a global track to be heard game-wide, then it becomes even more crucial that the stinger perform flawlessly, rewarding the player with the fullest possible expression of exultant emotion. Such a stinger will be heard many times over the course of the game and it must never wear out its welcome. After all, if players are to hear the same stinger on every victory, then they will undoubtedly associate that stinger with the entire game. The global victory stinger (as well as any other stinger used globally) will therefore need to be a reflection of the entire game score, with an iconic musical signature that will require focused deliberation and careful composition.

Defeat/Death Stinger

As the flip side of the victory-stinger coin, the defeat or death stinger is a short musical track that is triggered when the player fails a gameplay challenge. This failure may represent a simple setback, or it may manifest in the full-scale death of the player's character and the restart of a particular level or gameplay sequence. Sometimes this stinger is triggered at the end of combat, and may be composed to interrupt the combat track when the player is defeated. In this case, the death or defeat stinger should share thematic and structural similarities to the combat track it is superseding.

Unlike a victory stinger, there are two divergent compositional approaches that may be employed here. The defeat stinger can portray the dark emotion that would be associated with such a failure within the context of the game's narrative. On the other hand, the defeat stinger can use the *music as an audience* approach (discussed in chapter 6) and provide a third-person commentary by either emotionally empathizing with the player's plight or musically berating the player. Whereas with a victory stinger we expect a uniformly positive emotion, a defeat stinger has the opportunity to portray subtle shades of meaning that can suggest different points of view.

Death stingers may sometimes be global tracks that herald player death throughout the entire game. Since players are usually in a state of extreme frustration at that moment (because their characters just died), the global death stinger can become the unintentional target of considerable rage. For this reason, it may be best to make a global death stinger short and to the point. Unless the game is intentionally attempting to make player death a humorously enjoyable event, it may be best to remain musically understated with the global death stinger. A non-global death stinger may have the luxury of lasting a bit longer and being a little more emphatic. The same can be said of a defeat stinger, as it does not herald player death and therefore may not be greeted by quite the same degree of transferred fury as a global death stinger may attract.

Transition Stinger

Used to ease the player from one game mechanic to another, the transition stinger has many potential uses; these include bridging the player from exploration into combat, or from a puzzle or platforming sequence back into normal exploration. Unless composed for global purposes, the composition of the stinger should depend greatly on what music will follow it because, ideally, the transition stinger builds into an introductory expression of the next full-length track. With this in mind, we should compose the transition stinger to prepare the listener for the key and tempo of the track into which it is leading.

However, when transition stingers are intended for global use, they should be written to express a very

generalized sense of alarm (for transitions into action tracks) or a completely universal "falling-action" that would function to bridge the transition from a high-energy situation to a low-energy one. In these circumstances, since the tempo and key of the following track can't be predicted, an atonal or cluster-oriented approach with a lack of discernible meter may be a viable option.

Hint Stinger

This term is not in common use in the industry but I have yet to find an encompassing label applied to this particular variety of stinger, so we'll call it the "hint stinger" for the purposes of our discussion. The hint stinger is any short track meant to alert the player to a gameplay element that requires attention. Such a track may trigger when a player approaches an object to which the development team would like to draw the player's notice. This object may be a puzzle that must be solved in order to progress, a desirable item that is needed to complete a quest, or a route through the level that will lead the player to a desired objective. Alternatively, a hint stinger may serve to let players know that they have inadvertently put themselves in possible jeopardy by activating something hazardous or attracting the notice of an enemy. In this case, players may have a limited window in which to extricate themselves from the situation.

Hint stingers may emphasize a sense of mystery, discovery, and perhaps uncertainty or danger, depending on the nature of the hint. Unlike some other types of stingers, a hint stinger provides information that players need to advance in the game and is thus an operational component of the gameplay mechanic. Developers usually pay exceptionally close attention to music tracks that serve this function and may ask for several revisions before settling on a final choice.

Prize Stinger

Many video game genres give players the option of searching for a collection of prizes, usually including a set number of identical items. Once these prizes are collected, players may be rewarded by the game in the form of added strength and endurance, additional points with which to upgrade inventory items, or any other possible enhancement that the developers may imagine. This prize-hunting portion of the game is usually assigned its own unique musical stinger, which is triggered by the discovery of each collectable item.

The prize stinger may be regarded as a toned-down victory stinger, since the discovery of a prize is an achievement that players will regard with satisfaction. However, this stinger has also sometimes been structured with an air of mystery, as it is not always immediately revealed that the successful location of all items in a series will yield a special reward. Especially with story-driven games that attempt to work the prize hunting into the narrative, the prize stinger may have more in common with a hint stinger and feel less akin to a moment of victory. In other types of games that eschew realism, the prize-collection activity will have nothing to do with the narrative and the prize stinger may be more similar to a joyous celebration. Even so, the prize stinger is likely to be less jubilant than a full-fledged victory stinger because collecting prizes is usually not as important as completing game objectives.

Stingers in Action: *Dead Space*

As a practical case study of the use of stingers, we can find no better example than Jason Graves' soundtrack for the *Dead Space* game from Electronic Arts, a survival horror/shooter hybrid. In *Dead Space,* the player assumes the role of a ship systems engineer who finds himself stranded on a derelict vessel overrun with horrific creatures. The musical score of the game focuses on dissonant shrieking strings, great swells of brass, and other horror-style orchestral flourishes that are not unexpected for the score accompanying such a game. However, the triggering method for much of this music deserves our attention. In addition to full-length musical tracks, the game includes a collection of over a hundred short stingers comprised of frightening orchestral impacts, screeches, and jolting tone clusters. The game engine can randomly trigger any one of these fear-inducing stingers in response to whatever surprising or shocking events occur (Cowen 2011). The result of this stinger-based system is a musical score that can jump out of the shadows and yell "Boo!" at any moment in a completely unpredictable way. "It's sometimes very subtle," observes audio director Don Veca, "but can at a moment's notice move seamlessly into a blaring dissonant cacophony, supporting the action and drama of the game play" (Napolitano 2008).

The One-Shot Track

"One-shot" tracks are triggered, play once only, and then end. Because of this, they may be perceived to share much in common with music written for other fields (such as film and television). That being said, composing a linear one-shot track for a video game can be significantly different from composition for other media. There are several types of one-shot tracks that we will encounter:

- In-game one-shot
- Cinematics and cutscenes
- Scripted events

Each type of one-shot track has its own structure and purpose.

In-Game One-Shot

This is a track that will be triggered during gameplay but will not loop. It will therefore be written with a beginning, middle, and end. However, like the linear loop, the music of the in-game one-shot track must be written to accommodate any activity that may occur while the music is playing. We should remember that the ending of a one-shot track may not necessarily happen in the most advantageous moment, as the nature of gameplay at that point will be impossible to predict. With this in mind, the composer should remain aware of the resulting vacuum that will be created by the ending of the one-shot track and structure the ending to gradually diminish so that it will blend away into the general atmosphere.

Cinematics and Cut Scenes

Most of our work in video game music creation will be concerned with forms and structures that bear little similarity to the traditional composition undertaken by our counterparts in the fields of television and film. Cinematics and cut scenes, however, are very similar to scenes from a movie or television show, and thus offer us the chance to compose in a more conventional manner. We should seize these opportunities.

Both cinematics and cut scenes are devoted solely to advancing the narrative. Because they traditionally happen in a fixed sequence that plays out on a set timetable, they can usually be scored just as a film is scored. Certain musical effects can be achieved only through traditional means, and the cinematic and cut scene track allows us the chance to employ them. In particular, these can be fantastic opportunities to develop the game's themes.

Scripted Events

These are moments during gameplay in which a special, prearranged event occurs. Because a scripted event will occur during gameplay, it may not be entirely predictable in regard to dramatic timing. This may prevent us from scoring a scripted event with the same methods we would employ for a cinematic or a cut scene. Nevertheless, the theatrical nature of a scripted event may allow us to employ a few techniques from film composition that are difficult to use elsewhere, such as climactic builds and sudden stops. Such musical effects would be blatant landmarks in a looping composition and would be untenable within an interactive framework (more on this in the next two chapters).

Final Thoughts on Linear Music

In conclusion, let's now return to film critic Roger Ebert's controversial assertion that we first explored at the beginning of this chapter. Ebert tells us that video games can never be art because "Art seeks to lead you to an inevitable conclusion, not a smorgasbord of choices." In this chapter, we've examined this statement as it relates to both the interactive "smorgasbord of choices" and the linear "inevitable conclusion." Both of these concepts have a vital place in game development. As for the realm of the "inevitable conclusion" that this chapter primarily focused on, there is always an urgent need for the sense of momentum and dramatic tension that linear music does so well. Linear music is powerful—it can establish empathy, enhance suspense, and deliver the player into explosive moments of drama. It enhances the impression that our journey in the game is leading somewhere worthwhile, that in playing the game we are also writing our own story. This sensation of a meaningful journey offers support to the storytelling of the game, reinforcing the interactive nature of the narrative and the importance of our choices within it. Because we are so personally invested in these stories, their endings can be very affecting, and these emotions can help to elevate video games above the status of a simple pastime and into the realm of art (more on this later). For all of these reasons, linear music will always be tremendously important to the creation of a strong video game

score.

Interactive Music in Games: Rendered Music

As a part of our daily work as game composers, we spend a great deal of time devising the distinct components of our creations. We invent melodies and counterpoint, harmonies and rhythm, delicate patterns and beefy walls of sound. During this process, our music is likely to be comprised of a multiplicity of instruments performing concurrently. When we're happy with our musical compositions, then it's time for us to take the next step. Do we save the music as a file that maintains the separateness of each musical element, or do we render it?

To *render* is to bring about a transformation of something from one state of being to another. In digital audio, rendering is the art of converting a musical performance into a single file, such as a WAV, AIFF, OGG, MP3, or any other audio encoding format. Rendering incorporates all the previously independent musical events into one bonded entity that has the potential to embody the music's most ideal state, with every nuance impeccably highlighted and every musical element perfectly balanced. Prior to the final rendering, we can mix, master, and polish the music to a fine sheen so that when it is finally rendered, it becomes the best expression of our creative aspirations. So, now that we have a rendered music file, how do we make it behave interactively within a game?

This is one of the most difficult problems facing game composers. A perfected audio recording is highly desirable, and yet when we render we also eliminate all of those small musical components that can be so useful for the purposes of interactivity. We'll be discussing interactive models for unrendered music (which we'll be calling *music data)* in the following chapter. In this chapter, we'll be exploring the interactive possibilities of the rendered form of game music, and its unexpected similarity to a sophisticated pastime from a bygone age.

Interactive Music of the Eighteenth Century

Without the aid of video games to pass the hours, people of the eighteenth century turned to other forms of entertainment, including an interesting musical dice game. Retiring to their parlors, elegant ladies and gentlemen indulged in a little relaxed fun involving a set of game rules, some dice, and hundreds of measures of music. Each throw of the dice would determine which measure of music would follow in a composition governed partially by chance. When complete, the composition might adhere to a form such as the minuet but its musical content would be apparently original to whoever had thrown the dice. Luminaries such as Mozart and Haydn purportedly designed some of these musical dice games. The prominent eighteenth-century music publisher John Welcker described one such dice game as a "Tabular System whereby the Art of Composing Minuets is made so easy that any person, without the least Knowledge of Musick, may compose ten thousand, all different, and in the most pleasing and correct Manner" (Peterson 2012).

Figure 11.1
Four bars of music from Mozart's musical dice game. The tabular system assigned numbers to each measure of music.

These dice games brilliantly illustrated how satisfying it is to have the illusion of power over the shape and substance of a piece of music. In reality, the rules of the game prevented players from exerting too much influence over their dice-controlled compositions. Structural guidelines ensured that the resulting music would be acceptable and pleasing. Nevertheless, the games were fun because they allowed their players to interact with the music rather than passively listen and, in doing so, to imagine that they were creating something new. With this in mind, we might consider the musical dice game to be the earliest example of music interactivity in action.

Interactive music is a very important concept in the field of video games, and while it may seem to be a relatively new idea, it bears some striking similarities to that eighteenth-century dice game. In an interactive composition, music is created as a collection of component parts that are meant to operate together but can be presented in many different configurations. The game composer carefully constructs these component parts so that they will be musically pleasing regardless of the combinations that may be presented at any given time. More often than not, this musical configuration will be dictated by predetermined conditions within the game, but there are some interactive systems that introduce pure chance into the equation (reminding us of those eighteenth-century dice). In many ways, interactive music is like a game within a game, allowing players to indirectly nudge and manipulate the musical score even as they focus on other gameplay objectives.

In a video game, there are two distinct circumstances in which music may be said to react to the actions of players. The first is when a player takes a direct action in the game and the music responds by changing in some way. If the music gets more intense whenever a player shoots a gun, we can point to that as an example of a direct interaction between player and music. The second circumstance is when the music reacts to the general state of the game brought about by the player's actions. If the music becomes anxious whenever the player's health meter drops below a certain level, we can cite that as an example of such an indirect interaction.

Regardless of these two differentiations, players ultimately cause these musical changes. The music interacts with the variables introduced by players and adjusts itself accordingly. This type of music may be called "interactive," "dynamic," or "adaptive," with some subtle shades of differences to the terms. Those who prefer the terms "dynamic" or "adaptive" are sometimes seeking to differentiate the play mechanic of games in which players pretend to play actual musical instruments. In these "musical instrument" games, players are said to be actively aware that they are interacting with the music, whereas in other types of games players may not be so conscious of the cause-effect relationship.

Personally, I prefer the term "interactive." In my career, I've worked on many interactive scores and have had the opportunity to gauge player reactions to both my own projects and others that have taken an interactive approach. More often than not, players are fully aware of their power over the musical score whether they are playing a "musical instrument" game or not. Game reviewers and journalists are some of the most seasoned gamers out there, and they can be particularly perceptive when it comes to music interactivity, deriving great pleasure from performing actions that produce specific effects in the music. Like throwing the dice in that eighteenth-century game, players in modern video games enjoy the illusion of power over the shape and substance of a piece of music. The sensation contributes to the overall feeling of empowerment that the video game experience provides.

Horizontal Re-sequencing

In the musical dice game attributed to Mozart, musical pieces are broken down into segments consisting of the contents of a single measure. These segments are assigned numbers. Rolling the dice results in numbers that are used to determine which of these musical segments comes next in the resulting composition. Mozart composed the segments so that they could be juggled and recombined in nearly endless combinations. His game is, in fact, a low-tech but mathematically complex demonstration of a *horizontal re-sequencing* method.

In music, we mentally picture the ephemeral concept of time as a horizontal phenomenon, moving inexorably from left to right (like the notes on a musical staff). Likewise, most audio editing software visually presents audio as a waveform moving horizontally from left to right. The fundamental idea behind horizontal re-sequencing is that when composed carefully and according to certain rules, the sequence of a musical composition can be rearranged. This process occurs while the music continues to move forward on the horizontal axis of time, allowing a continuous free-flowing transformation of musical content.

Horizontal re-sequencing can occur with both rendered and unrendered music (in which the separate elements are stored in a bundle rather than a single audio file), but this interactive model is especially useful for rendered

audio because it addresses some of the problems posed by condensing the instruments of a musical composition into a single rendered file. In horizontal re-sequencing, a musical composition is constructed as a collection of segments, each representing a discrete chunk of the overall composition. The duration of these segments can range from a scant few to a large number of measures. Each segment of music may contain digital markers that indicate convenient and logical points at which the game engine may switch between that music segment and another in the collection. These markers may be positioned on each individual beat, at the beginning of each measure, or at designated points in the composition where switching to another music segment would be feasible.

Let's illustrate this with a few examples that will help us to understand how horizontal re-sequencing can function in a number of situations:

• Horizontal re-sequencing in action: *Speed Racer*

• Horizontal re-sequencing in action: *Tron 2.0*

• Horizontal re-sequencing in a quick time event

First, I'll describe a basic horizontal re-sequencing method employed in one of my projects, the *Speed Racer* video game score. This example only involves two files, which makes it fairly easy to understand.

Horizontal Re-sequencing in Action: *Speed Racer*

The *Speed Racer* game consists of high-speed races across colorful and futuristic tracks. As a part of gameplay, players can enter a special mode called "zone mode" in which their cars become faster and temporarily invincible. The game's producer and I determined that the zone mode needed distinctive music. Players could enter the zone mode at any time, so there would need to be zone mode music appropriate to every race in the game.

The zone mode lasts only around fifteen seconds and then the race returns to normal. Clearly, if the music for normally racing were suddenly replaced with a completely different track for only fifteen seconds, the result would be jarring. To address this problem, we constructed a plan wherein every track of racing music would have a related zone mode track. The zone mode track would be composed and recorded to sound like an ultra-hyper segment of the corresponding "normal" music. It would be triggered to start playing once the zone mode had been engaged, beginning precisely on the downbeat of a measure so that the transition from the main racing track to the zone mode would occur seamlessly. After about fifteen seconds, the zone mode segment would conclude with a couple of thumps from the kick drum, and then the normal music would be triggered to pick up at that point without missing a beat. In order for this to work, each zone mode track needed to trigger in perfect rhythm with its companion normal track.
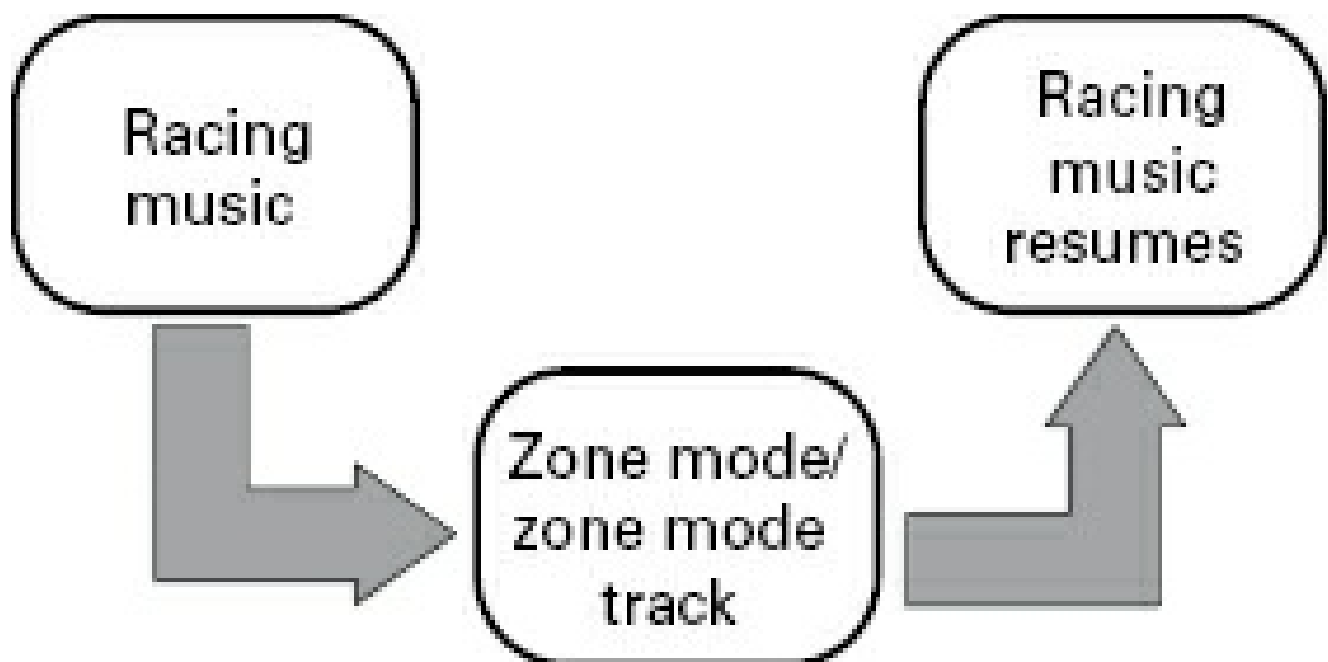
Figure 11.2
The *Speed Racer* racing music could be seamlessly interrupted by a zone mode track at any time.

This example involved only a simple switch between two interchangeable music segments. In a full-scale horizontal re-sequencing model, many audio files may be required for a single track of interactive music.

Horizontal Re-sequencing in Action: *Tron 2.0*

In the *Tron 2.0* video game from Buena Vista Interactive, the horizontal re-sequencing model features a much more complex design. *Tron 2.0* takes place in a glowing neon world that exists entirely inside a computer network, where computer programs are sentient beings and video games are brutal arenas in which programs fight each other to the death. Composer Nathan Grigg created a score for *Tron 2.0* that consists of a sound palette mixing electronic and orchestral instruments to evoke the high-tech, epic environment.

Using rendered audio in WAV format, the score has been broken down into many collections of audio segments, each encompassing only a few measures of music apiece. These were written with brief introductions meant to overlap any previous musical segment, as well as similarly brief closing material designed to meld with the musical section that followed (Whitmore 2003). In practice, the effect produced is often seamless and allows the music to react very quickly to changes in the state of gameplay. The sudden appearance of enemies can change the music from a low pulsing rhythm to a more insistently energetic pattern, while still maintaining the impression of a single unified musical composition.

While the interactive music technique used in *Tron 2.0* is much more intricate than the simple method found in *Speed Racer*, it is certainly not the pinnacle of complexity for a horizontal re-sequencing approach. Now let's examine an even more complicated situation involving a fight sequence based around quick time events.

Horizontal Re-sequencing in a Quick Time Event

Let's recall that quick time events require the player to hit buttons in a specific order while the game pauses for a moment, after which the action proceeds according to the player's success or failure with the button sequence. If we were to create music in a horizontal re-sequencing format that reacted to each stage of a quick time combat sequence, we might need a large collection of music files.

Let's say that in this sequence, players begin in normal combat mode, fighting a challenging miniboss character. When players deal enough damage, they enter their first quick time event, in which the action freezes just as the player character is about to seemingly headlock the miniboss. A successful completion of a button sequence will trigger an animation showing the player character headlocking and then bodyslamming the miniboss, effectively doling out massive damage. Failure will result in the miniboss landing a damaging punch, sending the player character hurtling backward. Then normal combat will resume until enough damage has been dealt to warrant a second quick time event, which will unfurl in a similar way (but with different character animations).

To score this with a horizontal re-sequencing method, we start by creating a short musical introduction of a few measures, designed to provide a comfortable transition from normal gameplay into combat. This introductory segment will switch seamlessly to a combat loop designed to play for the indeterminate length required before the players trigger their first quick time sequence. In our example, the first quick time event is triggered when players inflict a certain minimum level of damage on the miniboss. When this happens, the game waits for the next available marker in the combat loop (placed to indicate desirable points for changing to another music segment), and then switches to the first quick time event loop.

As this music loop plays, players are prompted to enter the quick time button sequence. Once the buttons are entered, the game determines if this sequence has been entered correctly and rapidly enough to warrant a successful outcome. If so, the currently playing quick time loop will wait for the next transition marker and then shift seamlessly to the appropriate success music that will accompany the on-screen animation depicting the player character headlocking and bodyslamming the miniboss. If not, then players will instead hear the failure music while watching their characters get sent flying across the screen in a humiliating animation. These unsuccessful players will then return to the previous combat loop and begin the process again.

Players who successfully complete this quick time event will hear a new musical loop as they progress to an escalation of the combat action. This new loop continues until players enter a second quick time event sequence, which begins the horizontal re-sequencing process all over again with new musical segments corresponding to each step of the action.
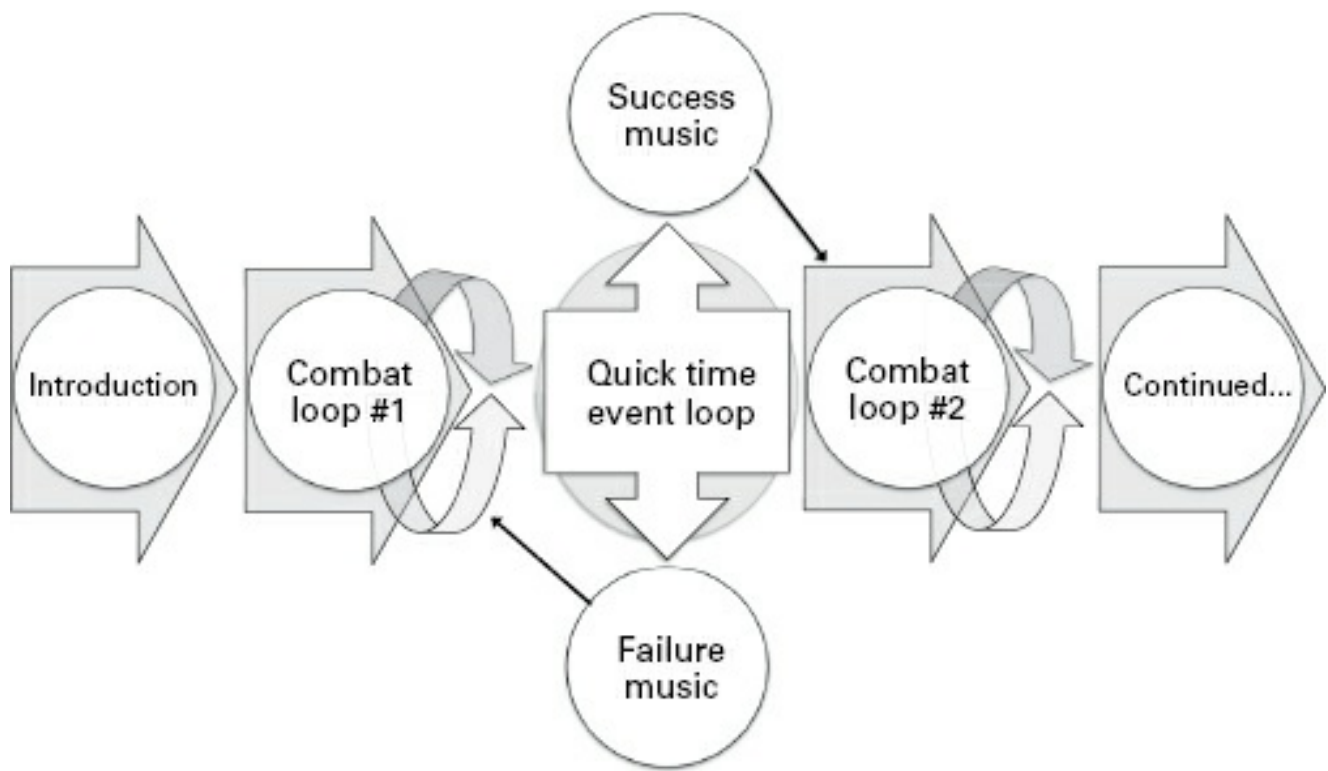
Figure 11.3
A hypothetical quick time event requiring several music segments designed to be horizontally re-sequenced during gameplay.

In order for horizontal re-sequencing to be successful, all of the musical segments must flow in and out of each other without giving any indication that the music has ever abruptly changed. The goal is to create the impression of one seamless musical composition that is somehow executing split-second reactions and adjustments to the state of gameplay.

Pros and Cons of Horizontal Re-sequencing

Composing music for horizontal re-sequencing can be an arduous endeavor. Taken to the extreme, music in this format may be written as a large collection of short files, each encompassing as little as a few bars of music per file. To lend a sense of overall structure, the musical piece may be broken into subsections, each containing many files capable of being played in any order. In this construct, the musical piece would then proceed from one section to another as circumstances warranted it, and this would cause another large group of short tracks to begin playing in an interchangeable sequence.

Clearly there are considerable advantages to the horizontal re-sequencing method. In its most idealized form, a score of this kind would create the same impression as a movie score, quickly reacting to every dramatic moment. However, as the horizontal re-sequencing method becomes more ambitious, there can be significant drawbacks for the game composer. Creating a large group of short musical segments that can be played in any order forces the composer to remain fixed in a set chord structure and tempo for as long as those segments are playing. This is because each segment must be able to transition to any of the others, and tempo or chord structure shifts would cause the switches between segments to feel jarring. Also, the short duration of each segment precludes the composer from creating thematic material that would last any longer than the number of measures encompassed by each segment. The final result may well be an interactivity model that actively encourages a composer to favor a certain level of musical simplicity, which can limit the composer's ability to create exceptional music.

While the limitations of horizontal re-sequencing may be significant, the potential benefits are profound. When used carefully and in combination with other methods of musical composition, it can offer very exciting possibilities to a game development team, allowing them to incorporate a musical score into their game that leaps nimbly from one musical thought to the next in perfect accord with the action of gameplay. For this reason, horizontal re-sequencing can be a powerful tool for a video game composer.

Vertical Layering

While the horizontal re-sequencing method bears some strong similarities to that eighteenth-century musical dice game, *vertical layering* takes a contrasting approach. The goal is essentially the same: to give music the ability to change and react to the conditions of gameplay. The difference lies in the system by which this result is accomplished.

In music theory, the word "vertical" indicates a simultaneous event such as the sounding of several concurrent notes in a chord. We can understand the applicability of the word by picturing the chord as notated on a single staff, the notes stacked on top of each other. A chord is always notated vertically, and all of the pitches of the chord are sounded at the same time.

Vertical layering operates under the principle of simultaneous, stacked musical components. To understand this, let's explore the subject and discuss its application in a few practical examples:

- Vertical layering versus stem mixing

- Vertical layering in action: *The Maw*

- Vertical layering in action: *inFAMOUS 2*

- Vertical layering in action: *LittleBigPlanet*

First, when attempting to grasp the core concept of vertical layering, it may be easier for us to assume the mindset of a mixing engineer, who would grasp the concept in different, more practical terms.

Vertical Layering versus Stem Mixing

Though vertical layering or "vertical re-orchestration" are both terms commonly used for this technique, we may also hear it referred to as "interactive stems." This can be a little confusing because those of us who are familiar with the art of the mixing engineer will likely recognize the word "stem" as pertaining to a very different concept. In audio mixing, a stem is a recording of some isolated part of a musical composition. It may be an individual instrument or it may be a subgroup of instruments that form a certain percentage of the whole ensemble.

For instance, in a pop song, individual stems for audio mixing may include the drums, guitar, bass, keyboards, and vocal. For mixing purposes, these elements are often recorded separately, but the mixing engineer still retains the ability to play them all at the same time in perfect synchronization. Separating them into stems means they can be mixed independently. Not enough bass? The mixing engineer can boost the level of that stem. Too much guitar? Again, that's easily fixed.

In other musical genres, stems can be recorded to enable the audio engineer to have a finer control over the mix. For instance, in an orchestral recording, the individual sections may be recorded separately so that the audio engineer can assert perfect control over the relative volume levels of woodwinds, brass, strings, and percussion. In this case, there are multiple instruments in a single recorded stem (such as timpani, snare drums, and cymbals in the percussion stem).

While the video game development community often uses the terms "stems" and "layers" interchangeably, it is important to understand the differences between the terms. Vertical layering does share some aspects in common with the use of stems in audio mixing. In interactive music, vertical layering involves the playing of multiple independent audio files simultaneously within the game's audio engine, which stacks these layers on top of one another in perfect synchronization. Interactivity is achieved through the independent manipulation of the layers, enabling the overall track to change in accordance with the fluctuating state of the game.

While this suggests that the game itself has taken on the role of a mixing engineer, we should bear in mind that the composition technique involved in vertical layering is fundamentally different than the process of simply preparing stems for mixing. In making recordings of stems in the audio mixing environment (sometimes known as "stemming"), it is generally understood that in the final result, all stems will be playing together. The composer or audio engineer is motivated by the desire to achieve a good overall mix. However, in vertical layering, the underlying motivation is to create separate audio files that are not always meant to play simultaneously. Instead, they can play in multiple configurations, interacting with the actions of the player as the game progresses.

In order to explore the vertical layering process in a less abstract way, I'll first describe a relatively simple

application of this technique for one of my own projects, *The Maw,* from Twisted Pixel Games.

Vertical Layering in Action: *The Maw*

The title character of *The Maw* is a one-eyed creature that will happily eat anything and everything, growing exponentially bigger as it does so. The overall tone of the game is unabashedly zany, and the Maw's ridiculous antics are both humorous and endearing. The development team for *The Maw* left the music design of the game entirely up to me, so I decided to explore an interactive approach for the musical score. Since the game focuses on the adventures of a blob-like purple alien resembling a ravenous walking mouth, I chose an eccentric, jazzy musical style that would highlight the game's visual humor. I also settled on the concept of vertical layering as my interactive model for the project. The game would be distributed as a downloadable title from the Xbox Live Arcade service, so I knew that memory space limitations would prevent me from having too many simultaneous layers in my tracks. I decided to compose three layers per musical composition. Having made this decision, I had to wrestle with several important issues:

- Additive and interchange techniques

- The vertical layering plan

- Opportunistic composition

- In-game behavior of vertical layers

Let's go over these topics, one at a time.

Additive and Interchange Techniques

In the vertical layering technique, two separate philosophies exist in regard to the relationship between layers. Let's refer to these two philosophies by the names *additive* and *interchange*. In the additive approach, the layers are composed so that they can all fit comfortably together, making it possible to play every layer simultaneously at full volume and still experience a musically satisfying result. In the context of *The Maw*'s interactive framework, with an additive technique the music would begin with only one layer playing, and then a second could be added, followed by a third. In a true additive composition, the resulting mix feels logical and pleasing. The additive technique is a commonly used method for employing vertical layering in video games.

As a contrast, in the interchange method, some of the layers are written with the intended purpose of replacing each other rather than coexisting. This construction makes it possible to create pairs of alternative layers, with each layer intended to replace the other and lend the composition a contrasting emotional effect. Alternative layer pairs may also be created to contain distinctly different thematic content for the same section of a composition. In a vertical layering composition based on interchange, if all layers are played simultaneously and at full volume, the result is jumbled and uncomfortable. Applying this to *The Maw*'s three-layer construction, the interchange technique would dictate that one layer provide a structural foundation for the piece, with the other two layers interchangeable but not able to simultaneously play. Perhaps because of this limitation, interchange is less commonly used than the additive method for interactive music design in video games.

Since *The Maw* would have only three layers, I opted for the additive method, judging that it would afford me the most options. If all layers can be played simultaneously in the additive format, then they can also be played in more combinations than those composed for the interchange structure. Additive provided two more combination possibilities for *The Maw* than interchange would have:

- Layers 1 and 2

- Layers 1 and 3

- Layers 2 and 3 (not possible in interchange)

- All layers together (not possible in interchange)

If we compose all layers so that they can be played alone as well as in combinations, then the overall musical piece has the potential to be presented in a wealth of possible variations. This allows the composition to change in many ways based on the state of gameplay.

The Vertical Layering Plan

In *The Maw*, I developed a fairly uniform plan for the vertical layering of each composition. This plan was shaped by two considerations that I believed to be very important for this project. The first was that the layers should all be able to play by themselves and be entertaining in their own right. With only three layers, it seemed prudent that every layer should pull its own weight. The second consideration was that when played simultaneously all of the layers should fit snugly together like pieces of a jigsaw puzzle, without any musical element being drowned out by any other. In other words, the listener should be able to clearly hear everything that's going on. After all, being able to distinctly perceive the addition and subtraction of each layer is a large part of what makes an additive composition so much fun.

To compose successfully with vertical layers requires the development of a strong plan for each track. Knowing that all layers must coexist peacefully, I made instrument choices for each of *The Maw*'s compositions before doing anything else, and then separated those instruments into their assigned layers. All layers would be constructed to work both in combination and alone, so I decided to treat each layer like a small instrumental ensemble. To show how such choices can be made for a simple vertical layering system, I'll describe the choices that I made for *The Maw*.
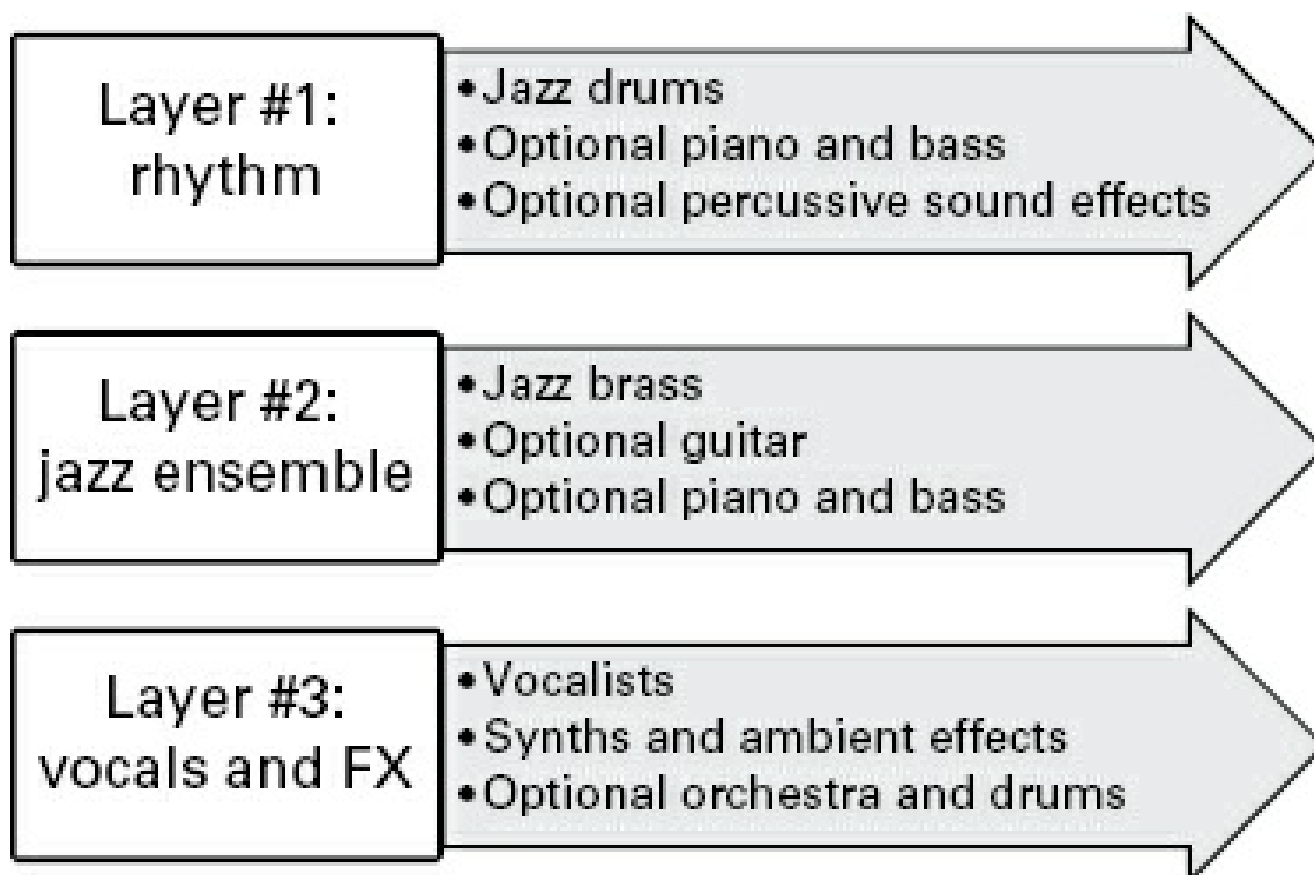
Figure 11.4
The vertical layering system for *The Maw*.

The first layer of each composition was usually rhythmic, with jazz drums serving as the primary instrument. Sometimes I'd also include the upright bass and piano in the first layer, completing the traditional jazz trio. With these three elements, I could be confident that layer one would be entertaining by itself. However, there were times when I wanted to reserve the bass and piano for use in layers other than the first one. In these circumstances, I still needed to make the rhythmic layer interesting enough to stand alone, so I used short percussive sound effects (frog croaks, rubber ducks, wood creaks, popping bubbles, squishing sounds, etc.) along with eccentric percussion instruments (flexatone, vocal beat-box, vacuum hose, pepper grinder, frying pans, Styrofoam, etc.) to accomplish the task. The wacky rhythmic effects created enough interesting foreground material to render the layer satisfactory when played alone.

For the second layer, I generally used a jazz ensemble consisting of saxophones, trumpets, and trombones. This I might pair with an acoustic rhythm guitar, or the upright bass and piano might go here (if they hadn't already been

used in layer one). This layer tended to feature some strong melodic content, which helped it to sustain interest when played by itself.

If the overall composition were to include vocalists, those performances would be included in the third layer, along with any electronic instrumentation and atmospheric ambient effects (such as wind and steam) that I had decided to include. Since *The Maw* takes place on an alien planet, it made sense to occasionally include some science-fiction instruments like theremin; these would also be placed in the third layer. Finally, there were times during *The Maw*'s score when the third layer included musical elements that provided a big contrast with everything else, such as large orchestral statements or tribal drums.

Opportunistic Composition

Once the decisions were made regarding what instruments would be featured in which layers, I could begin actual composition. Composing a track for vertical layering requires a peculiar mindset on the part of the video game composer. Instead of composing a single piece of music, we are essentially composing several coexisting musical works. Each layer needs to have its moments to shine, but not at the expense of the others. Ideally, the foreground content of a layer should behave opportunistically, nimbly jumping into the gaps occurring in the foreground content of the other layers. This presupposes that the foreground content contains gaps, which is usually a safe bet to make.

Melodies have rhythm, which is traditionally defined as the arrangement of sounds according to their duration and stress. This rhythmic arrangement helps us in our effort to create foreground elements that behave opportunistically. For instance, in the well-known nursery rhyme "B-I-N-G-O," the chorus returns repeatedly with the phrase, "*B—I —N-G-O, and Bingo was his name—oh!*" If this were the foreground melody of layer one within a three-layer vertical construct, we could write a foreground countermelody in layer two that jumped into the rhythmic "gaps" created after the "*B—*," the "*I—*," and the "*name—*" portions of the melody.

Figure 11.5
The "B-I-N-G-O" nursery rhyme. Rhythmic gaps provide opportunities for countermelody.

Moving beyond the melodic components, we can also take this opportunistic approach with percussive content, allowing drums in separate layers to leap into each other's syncopated gaps and pauses. In fact, any instrument can behave opportunistically. As we compose music in the vertical layering method, we may find ourselves looking at every single instrument in this manner, evaluating how we can fit everything together, jigsaw-style.

In-Game Behavior of Vertical Layers

In *The Maw*, the music of each level typically begins with the rhythm and wacky effects of layer one, played at full volume. This music continues as players initially explore the level. The other two layers are introduced to highlight situational changes and create different atmospheres for new environments. For instance, the appearance of an enemy or the initiation of a platforming sequence can trigger the addition of layer two via a fade-in. The resulting combination would render the music more complex and energetic, which suits the action. Later, layer two can continue by itself, with layer one gently faded out. Also, the two layers may play together with differing volume levels (such as full volume on layer two and half volume on layer one). Layer three will usually be introduced to highlight a special gameplay circumstance. For instance, in one level Maw gains the ability to fly, and layer three (featuring a light and airy choral arrangement) becomes dominant during his flight sequences. In another level, Maw gains the ability to fire lasers with his eyes, and an epic orchestral layer joins the others whenever Maw fires his lasers.

As we've seen, the vertical layering technique can be applied to a humorous game such as *The Maw*. In a comedic game like the one we've described, the interactive musical layers can quickly react to whatever wacky situations and characters that may be introduced at any given time. But does this technique function in the same

way when set against a dark environment with a stern and severe narrative? In order to answer this question, let's take a look at this same layering technique used in a much more serious game project.

Vertical Layering in Action: *inFAMOUS 2*

The *inFAMOUS 2* video game from Sony Computer Entertainment America follows the adventures of Cole MacGrath, a bicycle messenger who gains superpowers by virtue of a secret scientific experiment. Charging through the streets of a fictional city modeled after New Orleans, Cole seeks to find a way to defeat his ultimate nemesis, a seemingly unstoppable foe known only as the Beast.

The grim storyline and action-packed gameplay required that the music composition team create a very serious musical score, and the one they delivered is dominated by orchestral and rock-inspired arrangements with a mournful undertone. Just like *The Maw,* the music of *inFAMOUS 2* employed the vertical layering approach, but the method yielded a very different atmospheric result. When Cole MacGrath roams freely, the ambient music triggers interactive layers to increase or decrease the tension (Moore 2011). This practice continues within combat sequences, during which the layer system typically consists of three levels of intensity that the developers arranged with in-game functionality in mind. "We start to group these elements into high, medium and low intensity," described Jonathan Mayer, music manager for *inFAMOUS 2* (Savage 2009). "We can fade out, say, the high intensity elements when we want to, and then we've still got medium and low playing, and we can take medium down too."

While the vertical layering model used for *inFAMOUS 2* was similar to the technique I described for *The Maw*, the compositional philosophy behind it was not. Instead of composing with the interactive music system in mind, the music team at Sony Computer Entertainment America specifically avoided doing so. Instead, the composers employed conventional composition methods, submitting their music as session recordings with all instrumental elements remaining separate, rather than as rendered files that had been mixed and mastered. This allowed the developers themselves to divide the submitted compositions into layers without the composers needing to concern themselves with this aspect of the process. "We were very conscious to work with the music after the fact," explained Mayer (Savage 2009). "We didn't want the composers writing music for this system of technology. We wanted them to just write great music."

The vertical layering system of both *The Maw* and *inFAMOUS 2* is relatively easy to understand for the purposes of our discussion. Both projects used three layers to manipulate the intensity of an interactive musical composition in order to allow it to react to the shifting nature of gameplay. While three layers can be sufficient for an interactive score, adding more layers to the equation makes things exponentially more complicated.

Vertical Layering in Action: *LittleBigPlanet*

I've composed music for several games in the *LittleBigPlanet* franchise, including *LittleBigPlanet 2*, *LittleBigPlanet: Toy Story*, *LittleBigPlanet PS Vita*, and *LittleBigPlanet Cross Controller.* Anyone who has played these games knows that the music of a *LittleBigPlanet* console game is comprised of six interactive layers. Players know this because the game makes these layers available to them for the purposes of building their own levels using the game's creation tools. They have the option of using the six layers in any way they choose, including playing any one of the layers by itself, using several in combination, or playing them all simultaneously at full volume. As a composer, I have no idea how players will choose to implement my layers, so I have to craft my music to be ready for any eventuality.

When creating additive vertical layering music involving six layers, it becomes even more important to compose opportunistically. The foreground content of any layer must be ready to jump into the gaps left by the foreground content of any other layer. These maneuvers may begin to feel mathematically overwhelming. However, when the number of layers increases in this way, we can use tone color to help us.

Tone Color

In chapter 2, we discussed how listening sensitively to music can enable us to distinguish the instruments of an arrangement by virtue of their inherent tone colors. The concept of tone color encompasses those characteristics that distinguish sounds from each other. More specifically, tone color includes aural frequency, which determines whether we perceive a sound to be in the bass, treble, or mid range of the frequency spectrum. When a bass sound such as a tuba plays simultaneously with a low and rumbling timpani, the two sounds tend to blend together. On the other hand, when that same tuba plays concurrently with a treble sound such as a piccolo, the two instruments

remain crisply distinct from each other even when their musical activities overlap.

In vertical layering, we can take advantage of this phenomenon in order to differentiate our multiple layers and allow them to comfortably coexist. In planning for the six-stem approach of the *LittleBigPlanet* projects, I sometimes grouped instruments according to their tone colors. For example, in a particularly whimsical track I wrote for the "Victoria's Lab" level of *LittleBigPlanet 2,* I grouped the accordion, calliope, and vocal beat box together into a single layer, knowing that all three instruments create predominantly treble sounds that would leap out of the mix in the upper frequencies when that layer was triggered. Likewise, I grouped the electric bass and distorted guitar together in another layer because both performances favored frequencies on the lower end of the spectrum and would add a noticeably deep edge to the overall mix when the layer was activated.

This tone color awareness can provide assistance to the opportunistic composition process, giving the interactive composer even more options. The high-frequency foreground content of one layer can leap into the gaps created by the high-frequency foreground content of another. All of this can operate in counterpoint to mid- and low-frequency activity occurring at the same time, in which opportunistic composition techniques are also being applied. Admittedly, this is very intricate, headache-inducing work. Not many projects call for this level of complexity. However, these principles can carry over into less complicated situations, providing us with a wide assortment of creative options.

Conclusion

Like those eighteenth-century musical dice games, interactive rendered game music can be a lot of fun. It makes players feel empowered, as they are able to manipulate the musical score with their actions and instantly hear the results. Rendered music can be used interactively in a number of interesting ways. The techniques we've discussed have ranged from music segments shuffled in a horizontal re-sequencing model to vertical layers that add and subtract to the overall musical texture. These methods have created enormous opportunities for game composers to create highly reactive musical scores that feel fundamentally integrated with gameplay. In the future, game development teams will likely experiment with even more innovative approaches. Still, rendered music is not without its drawbacks. While rendering allows us to create a highly refined audio mix, we gain this sonic quality while losing the ability to finely manipulate the individual instrumental performances for the purposes of interactivity. Whether we address this issue through horizontal re-sequencing or vertical layering, we have to accept that there are certain inherent limitations in rendered music, which will have an impact on our interactive music plan.

With unrendered music, we'll find ourselves confronting a vastly different collection of advantages and drawbacks, and that's the topic of our next chapter.

12

Interactive Music in Games: Music Data

"Igor Stravinsky, acclaimed as the most distinguished, if not the greatest, of living composers, now sojourning in America after an absence of ten years, ardently advocates and practices the composition of mechanical music!" proclaimed an article from a 1925 edition of *The Independent* magazine ("Stravinsky Previsions a New Music"). In the article, Stravinsky hailed the *mechanical music* composition method as "A new polyphonic truth." In addition to the elaborate etude that Stravinsky composed for this new "mechanical" technique, many of his fellow composers added their own compositions to the repertoire of "mechanical" music. Alfredo Casella, Gian F. Malipiero, and Paul Hindemith, among others, created wildly experimental compositions for this new technology, which allowed a degree of polyphonic musicianship that exceeded the capabilities of any single performer. Through an innovative machine, a composer could create the dense contrapuntal complexity of a full orchestra without the need to employ a large group of musicians. It was a revolutionary concept.

The machine was called a pianola, otherwise known as a player piano. When we first hear mention of a player piano, many of us may immediately picture a dilapidated upright, autonomously banging out ragtime ditties from the corner of a saloon. Yet, the sheer ingenuity of the mechanics and design of the player piano deserves our attention. To describe it simply, a player piano executes its performance by virtue of a pneumatic mechanism, controlled by a sequence of instructions conveyed via punched holes in a long spool of paper known as a *piano roll*. This roll of paper may be especially interesting to us as modern composers. It represents one of the earliest systems for the transmission of a musical performance in the form of *data*. Each perforation in the roll constituted a separate note event, which the apparatus interpreted and performed. The more sophisticated piano rolls had the ability to transmit additional data related to tempo, dynamics, sustain, and other performance modifiers. The player piano was, in essence, an early music data system.

It's useful for us to consider the design and function of the piano roll as we delve into the concept of music as data. There are many parallels that will help us to better understand how such data systems impact our music composition methods, especially as we endeavor to create music that is highly interactive. Let's begin with one of the earlier forms of computer-based music data systems.

MIDI

As previously mentioned in chapter 2, the MIDI acronym stands for Musical Instrument Digital Interface. Many composers are likely to be familiar with MIDI, but for those of us who come from a more traditionally acoustic background, some discussion of this concept may be in order.

MIDI references a communications protocol whereby electronic instruments, computers, and other MIDI-enabled devices can exchange musical data. Much like the piano roll, this communication consists of note events and other related performance data, encompassing a huge variety of contrapuntal and homophonic possibilities. However, whereas the player piano transmits the data on the piano roll to a mechanical system, the first MIDI systems transmitted their music data from a controller such as an electronic keyboard to other devices via special cables that linked the devices together. Using MIDI, a single keyboard could send data to multiple electronic instruments. This data could include note events, uses of the pedal, sonic adjustments from sliders and wheels, and any other input that the keyboard might have been designed to receive.

At first, MIDI's biggest contribution was its ability to let one keyboard trigger sounds from multiple sources at the same time. When sequencers and computers got into the act, things really took off. A musician could send the data from their keyboard performance into a computer or sequencer device, which would record this data as a MIDI file. Then, the musician could hit the play button and the computer or sequencer would send the recorded data from

the MIDI file back out to the keyboard, triggering the keyboard's internal sound library and seemingly replicating the musician's performance with perfect faithfulness.

Stravinsky's enthusiasm regarding the "new polyphonic truth" of the player piano may spring to mind here, but the possibilities of the MIDI system went far beyond the autonomous performance of a single electronic keyboard. Eventually, as the sound palette of the electronic musician began to migrate from physical devices to software on a computer, MIDI's role began to take on new meaning. If the musician could input performance data into a computer, which would then trigger the sounds from within that computer, then the entire performance could exist within the computer in a digital state. There would be no need for the presence of a physical instrument. Essentially, we could dispense with the player piano altogether and create entirely virtual piano rolls that would trigger large libraries of sounds in myriad combinations. In fact, this parallel has not been lost on the music technology industry: the visual depiction of a piano roll is now found frequently in music composition software to represent the note events and music data of the MIDI system in a user-friendly way.
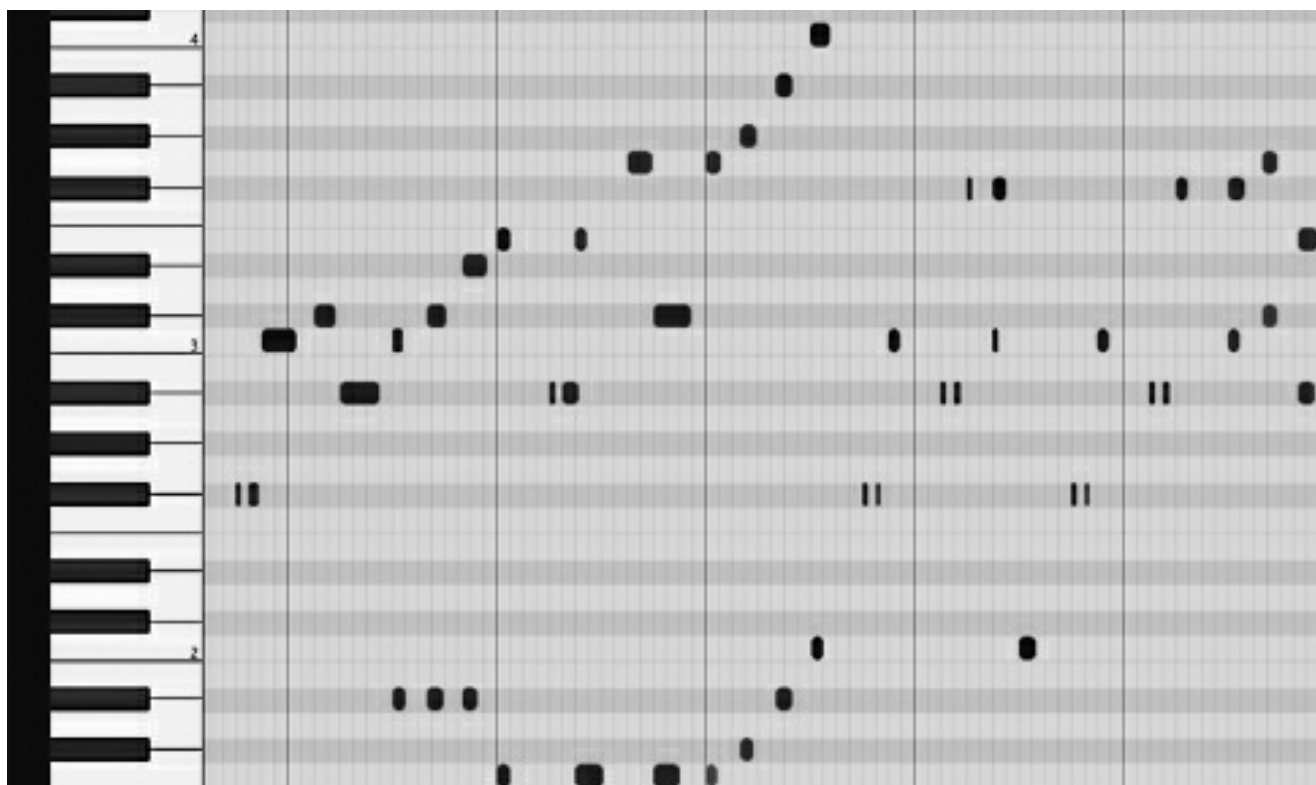
Figure 12.1
The "piano roll" depiction of MIDI events in the *Pro Tools* music application.

MIDI is used in video games to store note events and music data together with the library of musical instrument sounds that are triggered by the accompanying data in the MIDI file. The file size of a musical composition in MIDI can be much smaller than the size of an audio file in WAV format. Depending on the fidelity of the sounds and compression techniques used, the memory needs of the sound library can also be relatively small (although this memory savings comes with a price that we'll be discussing later). It is even possible for a game's MIDI files to trigger a built-in collection of basic sounds already present in a computer or game device. However, the sophistication of the sound library will have a direct impact on the overall quality of the music, so relying on such basic resources can lead to poor results. It's always better to spend lots of time (and significant memory resources) on a stellar sound palette for a MIDI game score.

In terms of interactivity, MIDI offers tremendous advantages. Using MIDI in a game means that the musical performance will be present as raw data that can be manipulated by the game engine during play. This opens up a world of possibilities for composers, audio leads, and programmers. When the music does not exist in a fixed state, it can be altered based on an endless list of variables. For instance, an in-game event can trigger a piece of music to change key. If the music had been recorded in audio format, any key change would also accelerate or decelerate the music. Likewise, a MIDI score can quickly change its tempo, whereas a tempo change to an audio score would also change its key (with a result that would likely sound unnatural). Individual instrument sounds within MIDI

tracks can be switched to other sounds during gameplay. The dynamics of a piece of MIDI music can be subtly or dramatically altered depending on the state of the game. MIDI tracks can seamlessly shift from one to another without the need for any special audio preparation for the transitions. The musical content can even be handed over to the game's Artificial Intelligence, allowing the AI to improvise and change the notes and rhythms autonomously (more about this in the section on generative music).

Any discussion of MIDI in video games must also include one of its most celebrated uses: the iMUSE system. Developed by LucasArts Entertainment and first used by its music composition team for their adventure game *Monkey Island 2: LeChuck's Revenge,* the iMUSE name is an acronym for Interactive MUsic Streaming Engine. In LucasArts' patent of the system in 1994, they described it as "dynamically composing a music sound tract in response to dynamic and unpredictable actions and events initiated by a directing system in a way that is aesthetically appropriate and natural" (Land and McConnell 1994). In simpler language, the system alters the musical composition in a logical way in response to the state of the game.

When it was initially created, iMUSE was used to extensively manipulate the MIDI contents of a game composition. The iMUSE system would choose from a broad array of options regarding how it would change the musical content while it was playing. It could introduce melodies or remove them. It could change instrumentation, alter the tempo, and transpose the key. It could shift from one piece of music to another while immediately incorporating musical transitions that bonded the two pieces together. For instance, in *Monkey Island 2: LeChuck's Revenge*, the main character starts his adventure in the little town of Woodtick. His arrival is marked by the beginning of an upbeat, cheerful theme in the iMUSE system. The theme follows him until he enters one of the structures in the town or engages in conversation with its inhabitants. At this point, the music switches to any of a number of variations that suit the nature of the encounter, whether the main character is having a conversation in a tavern, making some purchases at the local woodworking shop, or engaging in an argument with "men of low moral fiber" who might once have been pirates. These changes flow naturally out of the cheery Woodtick theme because the iMUSE system has the ability to alter the MIDI performance in progress, swapping one melody for another or switching between separate compositions on the fly.

The iMUSE system was revolutionary for its time. It was used by LucasArts from 1991 until 2013, when the company ceased operations as a developer (Rundle 2013). In its last known incarnation, iMUSE no longer controlled MIDI. Instead, it manipulated the way in which recorded music was played by the game engine. In fact, few modern video games rely on MIDI for their musical scores. Even with all the advantages that are offered by MIDI, there are also considerable drawbacks.

MIDI is a versatile communications protocol, able to transmit lots of data about a musician's performance, but there are some effects that just can't be accomplished using MIDI alone. As any mixing engineer can attest, a truly detailed control of overall sound quality can be attained most fully when a MIDI performance is recorded in multi-track audio format. This multi-track recording can then be run through one of any number of mixing options, from simple software solutions to massive automated mixing boards and digital audio workstations. While MIDI offers some limited tools for obtaining a satisfactory mix, they pale in comparison to the innumerable options afforded in an audio mixing environment.

In addition, while it is possible to create MIDI sound libraries that require a small memory allocation, this can be highly limiting for a game composer. Ideally, a MIDI sound library should be as musically expressive as possible, but such libraries tend to become larger as their sophistication grows. The memory needs of the game are constantly budgeted by the game developers, who make priority decisions regarding what game elements will receive the largest allocation of available memory. Unfortunately, this sometimes means that only a small percentage of available memory is allocated to sound and music. This can create considerable limitations on the overall size of the sound libraries available to the MIDI game composer. While technological advances in the capabilities of game systems such as consoles and computers have made these memory limits less stringent than they have been in the past, they still make it nearly impossible to faithfully replicate the sound of an orchestral instrument such as a woodwind or a violin. This may be one of the reasons why many MIDI game scores favor electronic instruments, since they are often aurally simpler and sound acceptable with smaller file sizes.

Yet there is some reason to consider MIDI (or a similar data-oriented music system) as a viable option for the future of video game music. "It isn't unreasonable to think that we may see a sort of return to a hybrid approach to composing, using samples and some form of MIDI-like control data," conjectures West Latta (2010), audio producer for Microsoft Games. "It is possible to think that the next Xbox or Playstation could, in fact, yield enough RAM and CPU power to load a robust (and highly compressed) orchestral sample library."

MOD

Now let's briefly discuss a file format that shares many common characteristics with MIDI and a strong association with the history of video games. It also bears an even more striking similarity to the player pianos of old.

The MOD, or Module Format, is a secondary file format that became popular in the early days of video game development. MOD shares some common bonds with MIDI. Both formats treat music as a data file, the contents of which include the musical performance and an accompanying sound bank containing the instruments to be triggered by that performance. The musical performance in a MIDI file, however, is a separate entity from its associated sound bank, while in MOD the musical performance and the sound bank may be combined into a single file. Also, the MOD file can be constructed of detached numbered musical patterns that can be juggled and reordered as needed. This enables the audio programmer to assign interactive behaviors to these patterns with relative ease.

Since the earliest days of its usage, MOD files were typically created with specialized software known as *trackers*. Unable to commit to memory a natural musical performance, a tracker program would remember musical notes that were manually entered into the system one at a time. This is where MOD files are most reminiscent of piano rolls. While the notes for a player piano were punched individually through the paper of the piano roll, the notes for a MOD file were entered individually using the letters and numbers of the computer keyboard.

The advantage of using MOD files lay in their ability to consolidate their sound libraries and music data into single files. "MOD files had an advantage over MIDI, then, in that music or other sound events would sound as the composer/sound designer intended," writes researcher Karen Collins (2008, 58). However, the MOD format and the tracker software had significant drawbacks. "Many composers have often cast a disapproving eye on MOD music, since methods of composing MODs are complicated and extremely 'non user friendly,'" writes Alexander Brandon (1998), vice president of the Game Audio Network Guild. "The task takes years of practice, years that budding conventional composers don't have."

A well-known example of a game that successfully used the MOD format is the science fiction shooter *Unreal* from GT Interactive. Set in a prison ship that crashes on an alien world, the main character is tasked with surviving the assaults of an invading army that has subjugated the local inhabitants. The music composition team constructed the entire game's score using MOD, which allowed both a relatively high sound quality and a good assortment of interactive possibilities. MODs enabled the level designers to transition subtly from one musical segment to another, and to alternate quickly between different tracks while keeping the overall effect smooth and satisfying. The result was very impressive for its time (Brandon 1998).

Today, we'll find both MIDI and MODs sporadically used in games created for some handheld devices that have memory limitations, making it difficult for them to incorporate an audio-only musical score. MIDI and MODs have both been replaced for the most part by methods that use rendered music recordings, which we discussed in chapter 11. However, as a unique form of MIDI-based music composition, *generative music* remains an exception.

Generative Music

Let's return, for a moment, to the concept of the eighteenth-century musical dice games we discussed in the previous chapter. We can describe the concept of generative music as an expression not of the musical fragments that are manipulated by the rules of the game but of the dice themselves. The core philosophy of generative music is based on the idea of indeterminacy—the introduction of chance into the unfolding of a composition and the randomization of musical content for the purposes of rendering something that is constantly unique. This interactive music system is sometimes also referred to as "algorithmic composition" or "procedural music," but the meaning is the same. Generative music can be a complicated subject, so let's break down our discussion into these sections:

- The first generative music
- A historical perspective
- An early video game case study
- Modern generative game music

The First Generative Music

To find the simplest and earliest form of generative music, we need look no further than the ancient musical instrument we have probably all encountered at one time or another: the wind chime. Crafted by a skilled artisan, the wind chime is capable of producing a carefully chosen set of musical tones, all with the ability to sound concurrently and produce a pleasing effect in numerous combinations. After fashioning this instrument, the artisan chooses a place to hang it and the wind does the rest. Through the influence of this random factor, the wind chime produces sequences of tones in a completely unpredictable manner. We can listen to the wind chime for a lengthy period before we hear any tone sequence that occurs in the same order and rhythm as any other we have heard before.

This example, though very simple, is a good metaphor for both the operation and the inherent goals of a generative music system in video game design. Generative music in video games is comprised of a collection of preexisting musical components such as melodic phrases, rhythms, and patterns whose content can be influenced by factors based on pure chance, the state of gameplay at any given time, and mathematical rules of probability. At their simplest, these probability rules share characteristics in common with conditional statements such as "if-then." As a theoretical example, a fairly simple if-then statement might look like the following:

If a piece of music is in the key of G major, and the last note sounded was an F sharp, *then* the probability of a G natural following this note will be 80 percent, a D natural 15 percent, and an E natural 5 percent.

The software then determines which of the three outcomes will be selected based on this system. These sorts of probability factors determine how instruments play in a composition characterized by a highly variable nature. The musical work may be a purely MIDI-based construct, in which the instruments exist as a library of sounds. Otherwise, the composition may be comprised of audio files containing prerecorded musical segments that are triggered based on mathematical algorithms. This system of musical indeterminacy and chance has an interesting history, from which we can learn a great deal about the core philosophy of the generative approach.

A Historical Perspective

While the idea of generative music is relatively new, it owes much to the earlier concept of "chance music" developed by avant-garde composer John Cage. In speaking about his philosophy of music, Cage said, "I have nothing to say, and I am saying it" (1939, 109). He believed that in removing himself as the final determinant of the shape and form of his music and essentially having nothing of his own to say, he would create something new. Cage was known for determining the shape of many of his compositions using the *I Ching* method, which involved the tossing of coins and the consulting of charts of divination (Pritchett 1993). Cage said: "I compose music. Yes, but how? I gave up making choices. In their place I put the asking of questions" (1990, 1).

Cage may have established the idea of chance music, but the composer who applied this theory to modern electronic composition came from a much different background. As a former member of the glam-rock band *Roxy Music,* Brian Eno had experimented in the 1970s with some chance music techniques involving pairs of tape recorders. However, it was not until the 1990s that Eno began to explore a process whereby computer software participated directly in the creative process, producing compositions that constantly shifted and evolved using mathematical algorithms based on probability and chance. Eno popularized the term "generative music" as a way to describe music with the ability to continuously and unpredictably generate itself. "I've always been lazy I guess," Eno (1996) said, "So I've always wanted to set things in motion that would produce far more than I had predicted."

Generative music offers the promise of certain specific advantages to video game development teams and publishers. If music is able to continuously generate new variations of itself by virtue of a mathematical algorithm combined with the element of chance, then it should be able to play for long periods while avoiding repetition fatigue. Also, the generative music system will theoretically produce vast quantities of music without the need for a music budget capable of supporting such a large amount of original content. Writing about the cost of man-hours in the production of video game assets, Dr. Ian Bogost (2012) of the Georgia Institute of Technology points out this practical advantage to procedural generation: "Where aesthetic rationales for procedural approaches hadn't made much headway, economic imperatives did. The rising costs of AAA game production catalyzed a new interest in procedural methods in game design." Nevertheless, Professor Tim Van Geelen of the Avans University of Applied Sciences offers a few words of caution about generative music: "It remains a largely unproven method. Developers of multimedia have to spend a significant amount of money on many different kinds of specialists to get a product

finished" (2008, 101).

An Early Video Game Case Study

While Eno popularized the term "generative music" in the 1990s, one of the earliest uses of such a system in a video game can be found in Peter Langston's 1985 score for *Ballblazer*, published by Activision. In *Ballblazer*, the game chooses from a set of thirty-two melody fragments based on probability calculations. Langston, director of games development for LucasArts and creator of this system, refers to it as "riffology." Using this system, Langston was able to produce music capable of playing for prolonged periods of time while avoiding repetition, but there were significant drawbacks to the system. "The music generated by this algorithm passes the 'is it music?' test," Langston writes (1986, 5). "However it doesn't pass the 'is it interesting music?' test after the first ten minutes of close listening, because the rhythmic structure and the large scale melodic structure are boring."

Efforts have been made to advance the art and science of generative music, including software solutions such as PureData, SuperCollider, and Noatikl that attempt to provide composers with better tools for the creation of procedural compositions. Even so, generative game music still faces an uphill battle when attempting to address Langston's "is it interesting music?" test. Careful and laborious attention to the rules governing the generative system can address this issue in part, but the inherently random nature of the system makes such a task very difficult.

On the other hand, the importance of solving this problem may sometimes depend on the development team's conception of the role of music in their project. The team may be happy with the musical content produced by the generative system whether it passes the "is it interesting music?" test or not. In this case, we should make every effort to create music that surpasses the team's expectations—music that passes Langston's simple yet very important test.

Modern Generative Game Music

Since the techniques involved in generative music are still fairly new to the field of video game design, their uses are not particularly widespread. Most developers prefer other methods of music interactivity, perhaps in part because of the complexity involved in designing and implementing a generative music system.

The most prominent example of a generative music system in a modern video game is to be found in Eno's score for the *Spore* video game from Electronic Arts. *Spore* is an innovative video game based around the idea of generative content. Environments, characters, and situations essentially construct themselves using algorithmic calculations. Because of the generative nature of the game, the developers decided that they would adopt a generative approach for the musical score. The audio team created a specialized version of the PureData software, and then Eno spent a week working with the team to create a large library of sounds and musical patterns for the generative system. Once the sounds and patterns were assembled, behavioral scripts could be applied to them. These behaviors would allow the musical patterns to adjust themselves to compensate for in-game events, as well as any other musical content that might be occurring simultaneously. Audio engineer Aaron McLeran described the process of creating music in this system as "composing in probabilities" (Kosak 2008).

Other examples of generative music in recent video games are to be found in releases for handheld devices. The more successful uses of generative music in these games fall into the category of "music games" in which the player's attention is already focused on musical changes, and the player is therefore better able to appreciate the generative system in action. In these games, players' actions directly influence the progress of the musical score. The game, through the use of the generative music system, creates the illusion of meaningful player participation in the music creation process. These generative musical scores tend to be fairly ambient in nature and usually favor electronic sound palettes.

Conclusion

Interactive music has become popular in recent years in the video game industry, and the odds are good that musical interactivity will continue to be a sought-after commodity. The various forms of musical interactivity do not each exist in a vacuum, just as linear music does not necessarily need to be the sole methodology for a video game score. All of these techniques can be used by themselves or in conjunction with each other in whatever combinations will have the most satisfying effect. In the end, the most important consideration for a video game composer is the

potential of the music to meet the needs of the game and entertain its players.

In chapters 11 and 12, we've discussed four different interactive music models and the ways in which they can enable our music to complement the action of a video game. Creating interactive music can be a fascinating and exciting endeavor for a game composer. In our enthusiasm for the methodology, we should remember to periodically step back and evaluate the music for its own sake, and not for the way in which it utilizes an interactive model. While interactive music can give the player a fun sense of empowerment over the score, this effect will not be sufficient if the interactivity has also negatively impacted the quality of the music. As game composers, musical excellence is always our principal goal. Using both our personal creativity and our sense of good judgment, we can carefully employ interactive techniques that will result in an outstanding video game score.

13

A Game Composer's Technical Skillset

Every so often, I'll get a cheery phone call. It goes something like this:

"Hello, Winifred! Hope everything is going well. How did that project turn out? Wonderful! It's great to touch base with you again. We were just talking about you here. What are you working on now? Oh, can't talk about it, yeah, I understand that. Anyway, just wanted to see how you were doing, if you're all set and have everything you need. I remember you bought those two PCs and the soundcards from us last year, and that sample library in March. Everything working out okay? Need anything else? We have a new promotion just for our special customers like you. . . ."

Yes, I am on a first-name basis with people who sell music gear. They call me regularly to see how I'm doing. They have deals just for special customers like me. When I first began my career as a composer, I never would have dreamed that technology would become such an enormous part of my creative life.

While none of us became composers because we love learning software and pushing buttons, as video game professionals we can't afford to be intimidated by technology. Our field is a highly technical one, though we may each interact with that technology in different ways. For instance, our relationship with music gear may depend on the type of composer we are. Composers with a focus on contemporary genres such as electronica may concentrate their software and equipment on loop-based music applications and high-end producer tools for sonic manipulation. Composers opting for a more symphonic approach may need to acquire the technical skills and equipment associated with acoustic instrument simulation.

So let's begin by discussing some of the gear that we may be using as high-tech music creators. Then later we can turn our attention to the more specialized tools we may need as members of the game development community.

Audio Technology for Music Composition

Before we can launch our careers as game composers, we must first build an effective and competitive music production environment in which to work. So, if we had all the money in the world to spend, what would be in our dream studio? These items would certainly make the shopping list:

- Computers
- Audio cards and interfaces
- Internal and external drives
- Keyboard controllers
- Mixers and/or preamps
- Monitors and headphones
- DAWs
- Plug-ins
- Soft synths and software samplers
- Sound libraries and virtual instruments
- Loops and loop-based software

For some of us, these tech items may already be a part of our working lives as professional composers, but

others may be less familiar with the world of music technology. With that in mind, let's go through this shopping list one item at a time.

Computers

The battle between Apple and Microsoft rages on, and we're all probably well aware of the fundamental ideological rift separating Mac lovers from PC lovers. Simply put, Mac computers have a reputation for user-friendliness and excellence in hardware design and manufacture, whereas Windows computers are known for an abundance of available software and the ability to easily upgrade the internal components. Regardless of which we prefer, the music technology industry has worked hard to accommodate both platforms. There are no longer any overwhelming advantages to choosing one side over the other. The choice nowadays comes down to preference and comfort level. We should feel free to choose whichever operating system pleases us best.

In a single-computer studio, the specs of the machine become paramount. In order for one computer to handle every task, it will need to have a powerful processor and as much RAM as possible. With this in mind, we may wish to buy as close to the "top of the line" as we can possibly afford. Processors currently come in multiple configurations of *cores*, which allow for simultaneous processing. More cores equates with faster operation overall, which is desirable for music applications. RAM functions as a computer's memory for short-term functioning. This is very important in music production, particularly when loading large software applications that require lots of RAM. Music creation can be a demanding task for a computer, so it's in our best interest to make sure our computer is powerful enough for the job.

While we're at it, we should also try to keep our main music computer uncluttered and focused solely on the task of music creation. Any non-musical software that came with the computer's operating system can be uninstalled. We may wish to avoid using this computer to connect to the Internet because anti-virus software is often incompatible with music software. We can think of this computer as a sterile environment, dedicated exclusively to music tasks. This may help the computer remain reliable and crash-free for the long haul.

While it is certainly possible to create worthwhile game music using a single computer, it can be tremendously taxing on the computer's processors, especially if we plan on using lots of plug-ins, soft synths, and software samplers (more on these later). The more demanding the tasks, the more likely our computer will slow down, freeze, or crash. When we start seeing these problems, we can take it as a sign that we should start adding additional computers to our studio. A multiple-computer studio also allows for the simultaneous use of both Macs and PCs. There are multiple advantages to this approach. Not only does it provide us with the opportunity to become comfortable with both operating systems, but it also gives us the option of running software that is either Mac or PC exclusive. For those instances in which a desirable software product is compatible with only one operating system, having both on hand becomes a definite plus.

In my own studio, I work with six computers (three Macs and three PCs). This is a relatively robust configuration, powerful enough to handle the day-to-day work without overwhelming me with the upkeep and maintenance issues that go hand-in-hand with computer ownership. I have a computer running my primary music application and the other computers run plug-ins, software synths, and software samplers. These "satellite" computers don't need to be as bleeding-edge as the primary one but I make sure they have a good supply of RAM and a strong multi-core processor because I want them to be as responsive and capable as possible.

Audio Cards and Interfaces

Computers need a way to send and receive audio. Most computers come equipped with their own internal sound cards, but the sound quality is usually insufficient for our needs. We have several options for addressing this deficiency, including internal sound cards and external audio interfaces. The primary purpose of these is to provide us with high quality audio inputs and outputs. We'll be able to obtain crystal-clear sonic fidelity with either option, but each also offers its own unique advantages.

Audio cards are installed directly into the computer. While this means that an audio card is not particularly portable or easy to replace, the internal installation tends to help audio cards respond more quickly to audio signal coming in and out—any delay will fall into the millisecond range. This delay is known as "latency," and less is always better. Audio cards almost always exhibit less latency than audio interfaces. High-quality audio cards also enable us to send and receive an audio signal that features a very high number of audio samples per second (known as the sample rate)—this allows for a final result that is exceedingly faithful to the original audio source.

An audio interface usually looks like an external box with inputs and outputs. We can integrate this box into our

studio by using a simple cable connection to our primary music computer. Because of this, an audio interface is conveniently portable and can be swapped between different computers as we see fit. However, audio interfaces tend to exhibit higher latency than internal cards, and many audio interfaces are not capable of the highest sample rates.

Internal and External Drives

Hard drives provide us with storage for our computer's applications and files. Unlike RAM, a hard drive can store data for a long time. In traditional magnetic hard drives, a spinning platter holds the data, and the speed with which the computer can locate the requested data depends on how fast the platter spins. This speed can be a crucial issue. In music applications, we often use hard drives as a location for the writing of audio files while recording. If the drive is unable to write the data quickly enough, the in-progress recording could freeze or crash. Also, music software accesses audio data the moment that it is needed, relying on the speed of the drive for this task. This compounds the need for a fast drive.

An internal drive is mounted inside the computer, whereas an external drive is connected by cable. In terms of comparison, the external drive may have a slight edge. The performance of an external drive can equal that of an internal drive, depending on the type of cable connection. An external hard drive is also portable and can be used with different computers when desired, which provides an extra layer of convenience. Finally, if an external hard drive fails, we don't have to open up our computer in order to replace it.

Alternatively, solid-state hard drives provide an option beyond traditional magnetic drives. This mode of storage has some advantages and drawbacks. Solid-state drives do not need a spinning platter in order to read and write data. This makes them faster, more durable, and perfectly silent. However, their performance tends to degrade over time. Also, they can fail without any warning, which can lead to catastrophic data loss.

Keyboard Controllers

Musical keyboard selection is a very personal choice. Many factors can influence our decision. One of the main factors will be the basic type of keyboard that we choose—a simple instrument designed purely to control MIDI data or a more feature-rich device providing a full complement of on-board sounds. The latter type of keyboard broadens a composer's sound palette with additional choices.

Yet this isn't the only way that a keyboard can step beyond its primary function as a tool for the sending and receiving of MIDI data. Toward the top of the line, we'll find full-fledged keyboard workstations with built-in MIDI sequencing and audio recording. This type of bonus functionality may seem attractive but we should remember that all of these functions are routinely performed by computer software. The necessity of physically integrated recording and sequencing may offer the strongest benefit to the traveling musician, now afforded the luxury of leaving the computer at home. On the other end of the spectrum, we'll find keyboards offering no internal sounds at all but featuring many faders, knobs, wheels, buttons, touch pads, and pedals for sustain and volume control. This type of keyboard is designed specifically for musicians who intend to access their sounds externally and want to have a multitude of ways to finely control them.

Beyond these considerations, the actual tactile experience of the keyboard becomes important to consider. Some of us will want the keys to have that light, spring-loaded feel typifying electronic organs, while others will want the keys to have the solid, weighted hammer-action of a true piano.

I work with a weighted keyboard that exists at the mid-point between a workstation and a pure controller. My keyboard has a sound library on board but no sequencing or recording capability. It offers faders, buttons, wheels, knobs, and pedals galore. Most important, my keyboard has eighty-eight keys. This is the number you'll find on an acoustic piano. If I could, I'd buy a keyboard with more keys than this, but there are no models available that exceed eighty-eight. I find that in my work I'm often loading a collection of related sounds into one virtual instrument and then spreading those sounds across the keyboard until I run out of keys. I'm *always* running out of keys. Not everyone will feel the need for the full eighty-eight-key spread, but it is definitely worth careful consideration.

Mixers and/or Preamps

While many audio software packages offer the ability to mix entirely within the digital domain, some of us may prefer the feel of physical sliders and knobs. Mixers exist to satisfy this need. We can choose from among a wide range of options, from a simple unit offering only a single volume fader and pan knob all the way to extravagant

mixing desks offering hundreds of channels. Small mixers also exist for mounting in racks; they provide routing solutions for audio signal but are less useful for actual mixing.

Regardless of their size, these devices often provide built-in preamplifiers for input that needs boosting—microphones and analog instruments fall into this category. In addition, some audio interfaces also provide built-in preamps of this kind. If we are using an external mixer and an audio interface that both provide preamplification, we will need to evaluate the technical specs of the preamps to determine which will provide superior sound quality.

If none of these options are satisfactory, we should then begin considering the purchase of a dedicated preamp. Many rack-mountable solutions exist, from single-channel or multi-channel units designed solely to provide crisp and clean microphone signals to preamps dedicated to boosting the audio signal of other instruments such as guitars and analog keyboards. I use a dedicated microphone preamp and a rack mixer with built-in preamplification for the vintage sound modules in my studio that don't have digital outputs. Otherwise, I do all of my mixing within my audio software.

Monitors and Headphones

The subject of monitoring can be a particularly contentious topic, partly because of the extremely personal nature of the listening experience. Put simply, everyone places a different subjective value on various characteristics of sound. Even among experts in the physiology of human hearing and the psychoacoustics of audio, disagreement may exist on the topic of what constitutes quality sound reproduction. "Expert A may be terribly, terribly critical of what happens in the high treble range, expert B may be hypercritical of bass, and expert C may have a Thing about middle- range smoothness," writes J. Gordon Holt (1990), founder of *Stereophile Magazine*. "It is not at all unusual for an equipment reporter to 'slant' his evaluations on the basis of a few things which he considers to be of particular importance."

Because of this variation, personal inclinations in regard to the ideal listening space can vary from one individual to another. Those who prefer a loudspeaker system will extol the virtues of hearing sound naturally through the air, and then describe painstaking procedures for the positioning of each speaker to compensate for the reflections of the room. Those who prefer headphones will describe the minute aural details that can be discerned, and then proceed to emphasize the importance of such headphone characteristics as diffuse-field equalization and deep bass extension.

At the end of the day, all that matters is our own personal comfort and happiness within our listening space. Ideally, our music should sound equally good from headphones and speakers, so we'll definitely want to check our final mixes in both environments. In my everyday workflow, I prefer to use a pair of very high-quality headphones. I like the finer details that can be detected, allowing me to be more targeted and precise in my composition and mixing.

DAWs

The acronym DAW stands for *digital audio workstation*. A DAW is a complete system for the creation of audio content. The term was originally coined before capable personal computers that could be incorporated into such systems existed. Early DAWs resembled mixing boards that could record and process audio without additional components. Now, a DAW typically includes multiple pieces of equipment that are linked together to function as an all-purpose audio creation powerhouse. DAWs normally include a computer along with an audio interface or sound card, a software application designed to provide audio editing and creation tools, and user-interface peripherals such as MIDI controllers, mixing surfaces, and the traditional mouse-and-keyboard combo. That being said, in most circumstances when we hear a discussion of the merits of DAWs, the conversation tends to focus on the software.

DAW software usually mimics the traditional user interface of a multi-track recorder. This includes transport controls (such as "play," "stop," "pause," and "record"), a window showing a graphical representation of recorded waveforms, and a window resembling a mixer (with standard faders and knobs). These controls provide all the core functionality of a digital audio workstation, but modern DAW software tends to go beyond this. Many DAWs now incorporate music notation, previously available only through separately purchased software. The same can be said for MIDI sequencing programs, which were formerly distinct entities and now are thoroughly integrated into the framework of many DAWs. Also, many DAWs now include a collection of virtual instruments and either a sample player or a full-fledged software sampler (more on this topic later in the chapter).

Choosing a DAW is one of the most important gear-related choices we'll make in our careers. DAWs are behemoths of the music software world, towering over all other applications in terms of their sophistication,

capabilities, and complexity. Learning a DAW can be an arduous process and it can take quite a while before we feel truly comfortable with the software. However, once we've hit that comfort level, we're unlikely to switch from one DAW to another. Faced with the prospect of mastering that steep learning curve once again, most of us would prefer to stay with our current software, whether we're entirely happy with it or not. This is the reason why our initial DAW choice is so crucial. Whatever our choice, we're likely to be living with it for quite a long time.

Thankfully, there are some inexpensive DAWs that newcomers can try on for size. It's hard to anticipate what features will be most important to us until we have a chance to fiddle with an entry-level DAW for awhile. Once we become frustrated with specific aspects of the rudimentary software, we'll have a better idea of what qualities to look for when we're shopping for a professional-level workstation. Searching the Internet for the phrase "inexpensive DAW" will turn up some results that should get us started.

Plug-ins

Plug-ins are small programs that plug into a larger software application, such as a DAW. These smaller applications allow the DAW to accomplish additional tasks for which it may not have originally been designed. In most DAWs, plug-ins are accessible via a special drop-down menu. Some plug-ins serve as fully featured virtual instruments that respond to MIDI and add to our overall sound palette. Other plug-ins perform highly specialized audio tasks such as the application of reverb, compression, equalization, limiting, and other exotic effects and filters. Finally, there are plug-ins that can perform meticulous adjustments to our audio content, from pitch correction and noise reduction to increasing stereo width and apparent loudness.

In my experience, plug-ins are like potato chips. We may try to eat just a couple of chips, but temptation is hard to resist. Plug-ins can be very entertaining, adding novelty to our workday and helping us to feel inspired. However, each plug-in also adds extra processor load to our DAW. In addition, plug-ins can be very expensive, and tinkering with plug-ins can turn into a time sink that pulls our attention away from music composition. Finally, if we use too many plug-ins, our music may sound overly processed.

Personally, I take a cautious approach to the use of plug-ins. I funnel most of my reverb and signal processing tasks to a separate computer running a stand-alone audio processing application, which removes the processor load from my main DAW computer. I use plug-ins for some occasional light limiting, as well as some surgical adjustment of sonic frequencies for individual instruments within a mix. Other composers may use plug-ins more heavily and be very happy with the results. It is all a matter of personal preference and workflow.

Soft Synths and Software Samplers

Soft synths and software samplers have some fundamental things in common. They are both virtual sound modules. Before computers took over the world of music tech, we might have purchased such sound modules as physical devices for mounting in an equipment rack. Each module would offer its own unique library of sounds, and adding a new module to our studios would expand the breadth of our instrumental tool set. Now, these modules come in digital form, but our relationship with them remains similar. Soft synths and software samplers each offer a library of instruments whose sounds are arranged across the keyboard controller in a manner that allows them to be triggered in various ways depending on the nature of the incoming MIDI data.

While soft synths and software samplers are both virtual sound modules, they are quite different in the way in which they produce sound. Soft synths focus on sounds that are generated algorithmically within the application. Software samplers specialize in prerecorded audio files. Known as samples, these audio files allow a software sampler to emulate acoustic instruments. Soft synths are more typically associated with synthetic sounds, although some use physical modeling synthesis to produce the sound of an acoustic instrument by mathematically simulating the waveform.

Soft synths and software samplers continue to innovate, offering more sophisticated tools for the manipulation of sound. This can sometimes place an increasing demand on the resources of the computer hosting them. Most of these virtual sound modules can be used as either plug-ins or in stand-alone mode on a separate computer, and the stand-alone option can ease the processing burden on the DAW.

Sound Libraries and Virtual Instruments

This broad category covers everything from mammoth orchestral libraries featuring hundreds of gigabytes of instrumental content to tiny sample libraries containing such specialized content as 8bit synths or Polynesian conch shells. Both large and small libraries can be tremendously useful.

A sound library is comprised of a collection of samples. In the case of a musical instrument, a sample is usually a recording that captures the performance of a single note. Every note of an instrument can be recorded separately, and those notes can then be spread across the controller keyboard. This process, known as "multi-sampling," renders the musical instrument playable through the MIDI controller. A sound library may contain enough samples for one multi-sampled instrument, or it may include many instruments broken into file folders for easy access.

Sometimes a sound library provides prebuilt instrument files that can be loaded into a software sampler. Each of these instrument files loads the appropriate sound samples and arranges them across the keyboard in a way consistent with the instrument in question. For instance, a piccolo instrument file would arrange the library samples for the piccolo on the keyboard in the appropriate range for the instrument. Going further, a full-fledged virtual instrument often contains programming that endows it with additional behaviors aimed at attaining a higher degree of realism and expressiveness.

Video game composers are often called on to create in a plethora of contrasting musical genres. Sound libraries and virtual instruments can be invaluable in helping us to achieve the signature characteristics of a distinctive musical style. However, even the most extensively programmed or meticulously modeled instrument is likely to sound artificial or disconcerting unless it is handled very carefully. As musicians, we are thoroughly acquainted with the mechanics and physics of the acoustic instruments we play. For instance, a trumpet player fully understands the operation of the valves, the buzzing of the lips, adjustments in embouchure, tonguing methods, and many other specific techniques associated with the instrument. But a composer using a virtual trumpet may find it difficult to execute a believable performance without first becoming knowledgeable in the fundamentals of the instrument in question. A quality sample library for the solo trumpet will provide many different "articulations," which in this context refers to differing playing techniques. A quality virtual trumpet instrument may place these same articulations within the instrument's programming, accessible through the electronic keyboard by virtue of specific MIDI controller messages. All of this is beneficial to us only if we understand when the use of a particular trumpet articulation will make logical sense and result in a natural-sounding performance. Employing articulations when they wouldn't logically be used will lead to unconvincing results.

Ideally, we'd like to be able to hire experienced musicians whenever the need arises, but short production schedules and tight budgets can make this challenging. Regardless, we will certainly be called on to simulate realistic acoustic instruments, if only as a demonstration to our supervisors of how the finished recording will sound. High-quality sound libraries and virtual instruments help us accomplish this task. In order to use these tools to their fullest potential, we must train our sensitive ears to the nuances of acoustic musicianship, and then adjust our simulated performances to reflect those small details that will lend our recordings realism and depth.

Loops and Loop-Based Software

We've already discussed the concept of loops as they relate to the overall structure of video game music, but loops are also significant on a much smaller scale. In addition to the sample libraries we previously discussed, a *loop library* is a commercially released collection of short recordings (usually only a few seconds in duration). Intended for use as building blocks within the body of original compositions, these short recordings feature rhythmic patterns, instrumental phrases, and ambient effects that are edited so that they may repeat for however long the composer wishes. Many composers use these loops as structural foundations for their tracks, layering original thematic content over the repeating rhythms or tone patterns.

Many software samplers are designed to successfully load and play loops. In addition, some loop-based applications offer numerous tools that allow a composer to add them to or subtract them from the texture of a track. These specialized applications are particularly useful for music creation in contemporary popular genres, where rhythm and tone pattern repetition has become pervasive.

This is not to say that composers in other genres can't benefit from the use of either loops or their intrinsic musical content. For instance, excellent loop libraries exist that specialize in drums. Some feature a single type of drum performed by a solo drummer. In this case, all of the loops have likely been recorded in the same space, on the same instrument. This is a circumstance in which the loops can be regarded as short recordings that we are under no obligation to repeat. We can play each one only once, and combine them in any order we like. We can even edit these loops into smaller fragments containing short syncopations and alternate these fragments with the larger phrases to create greater variety. By virtue of these techniques, we can prepare our drum library so that it provides a very large rhythmic vocabulary with which we can lay out a beat and syncopation structure that fits well within our planned original composition.

Other types of loop libraries can be used in a similar manner. They can also be looped as originally intended, using either loop-based software or software samplers. Loop libraries have the potential to offer many interesting creative possibilities.

Audio Technology for Game Development

Now that we've completed a general overview of the software and equipment used to compose and record music, let's take a look at some technologies that we may encounter in our jobs as game music composers. These include:

- Proprietary software

- Middleware

- Surround sound

These technologies have unique applications in the field of video game development, and also have the potential to impact our working lives as game composers.

Proprietary Software

In our careers as game composers, there may be occasions when we are asked to learn a software application that was created by the developer. This is typically called "proprietary software" because it is their original property. Development studios with sufficient expertise and resources will build their own audio engines in order to exert a greater degree of control over the audio in their games. Some of these in-house tools have been used to implement audio for numerous game projects over the course of many years. The development team knows that a new composer can't be expected to be proficient with the software immediately, since it isn't available to anyone outside of the company. In these circumstances, we can rely on our supervisors at the development studio to walk us through the specifications and operations of their proprietary tools.

On occasion, we may also be asked to learn how to use proprietary software belonging to a console manufacturer such as Nintendo, Microsoft, or Sony. As we discussed in chapter 7, these companies create software development kits (SDKs) for the use of studios that have obtained a license to develop for the respective game systems of the big three console manufacturers. In the case of Nintendo and Sony, the proprietary software in their development kits isn't readily accessible to a freelance composer because these companies make their SDKs available for purchase by licensed publishers and development studios only. Because of this, we won't have the opportunity to use the audio tools in their software development kits until we're hired for a project intended for one of their game platforms. Once hired, we can request temporary access to a loaned SDK and cheerfully plunge into the learning process if we receive one. Thankfully, in these circumstances we can once again rely on the development team to understand our situation and help us out.

In the case of Microsoft, however, we don't need access to the official SDK in order to use the software because we can download it for free. Microsoft makes its SDK software available for immediate download through its website. Since a separate stand-alone program called XACT handles all the audio tasks of this SDK, it acts in much the same way as a *middleware* application, which is our next topic of discussion.

Middleware

As a type of stand-alone software that incorporates itself into a game engine in order to perform a specific task, middleware adds functionality to the primary application. There are many types of middleware available to developers, but the type that concerns us relates to audio implementation.

Several middleware applications dedicate their resources to providing tools for the inclusion of interactive audio in a video game. Most of these have specific features designed to provide options for the deployment of music. Happily, some of these software applications are free for composers to download and use. Fees for these applications are exacted only if the middleware is actually incorporated into a commercially released game, and the developer and/or the publisher is then responsible for those expenses.

There are several brands of audio middleware. Three of the most popular audio middleware applications are:

- Wwise

- FMOD

• XACT

Before we begin a brief overview of these applications, let's talk for a moment about an issue that may arise when we are first acquainting ourselves with the software. Audio middleware applications are meant to address the audio needs of an entire game. The programs are equipped with music functionality, but the manuals and tutorials focus first on the implementation of sound effects and environmental ambience before addressing music. For the aspiring game composer, this can be a problem. If we concentrate solely on the music sections of the software documentation, we're likely to be very confused because in those sections it will be assumed that we're already familiar with a wide variety of concepts previously covered in the sound design portions of the document. With this in mind, we may need to consult additional resources to help us learn the music systems of these software applications. Fortunately, the game audio community has produced some excellent video tutorials on some of these middleware applications, which we can find on such video streaming sites as YouTube and Vimeo.

While each of the following three audio middleware applications will have fundamentally different philosophies in terms of user interface and workflow, they all provide the same core functionality. Each allows for the loading of music files and their arrangement into groups for the purposes of conferring specific interactive properties. The user can assign looping behaviors, transitions, and crossfades. Branching paths can be created for the triggering of music segments in a horizontal re-sequencing model, and loops can be set for simultaneous playback and interactive switching according to the vertical layering method.
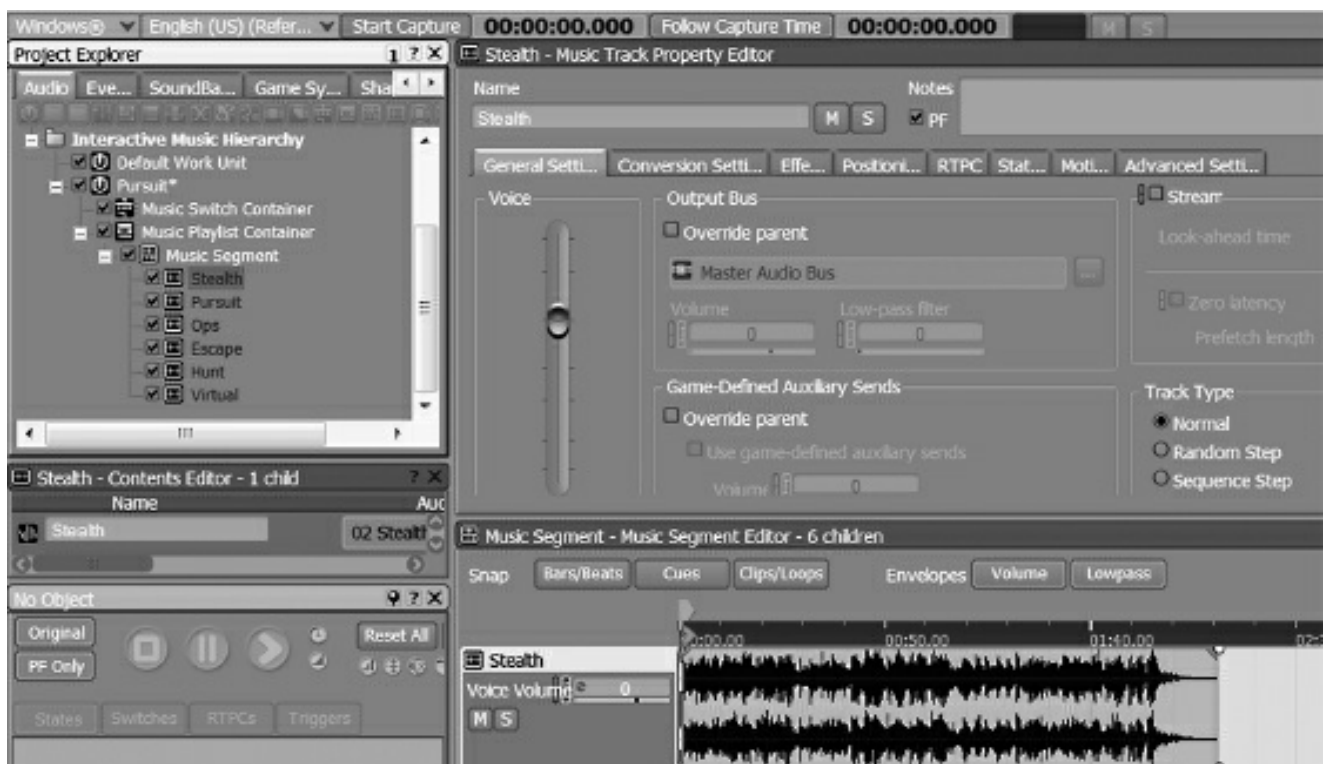
Figure 13.1
Wwise, developed by Audiokinetic Inc.

The Wwise application was first debuted by Audiokinetic Inc. at the Game Developers Conference in 2006. The name stands for WaveWorks Interactive Sound Engine. Wwise is based on a highly hierarchical structure consisting of three main units of organization. *Work units* are the overall data constructs in which all the assets and behaviors of an interactive music system are contained. Within the work units are *containers* that are used to group sound objects together; this enables music tracks to be organized into playlists and assigned interactive behaviors. Within the containers we'll find the *segments* that serve as holding bins for the actual music tracks that are accessed and manipulated by the containers. At first seemingly unintuitive, this tiered structure can become comfortable and logical, especially after following along with the provided tutorials. One of the ways that Wwise continues to distinguish itself is through the creation of solid documentation, including the "Project Adventure" package of tutorial documents and sample projects that help users learn the software with a hands-on approach. As a relatively new audio middleware application, Wwise has a reputation for being a powerfully flexible tool for sound designers and game composers.
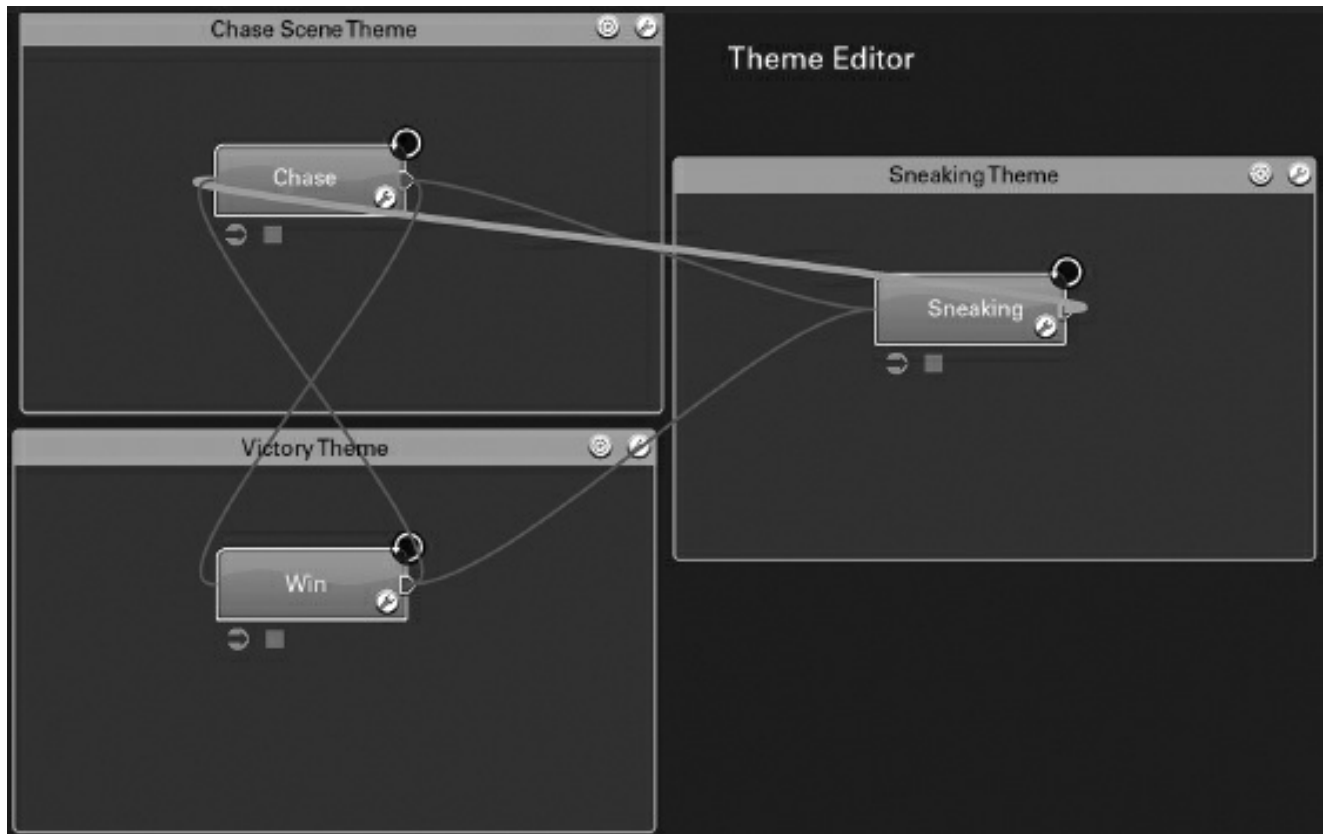
Figure 13.2
FMOD Designer, developed by Firelight Technologies.

Firelight Technologies created the FMOD application in 2002, intending for it to serve as a simple audio player for games. Today, FMOD Designer is one of the most popular audio middleware solutions for game developers. Based around a user-friendly graphical interface, the software was originally designed to resemble the Digital Audio Workstations that sound professionals have used for many years. The FMOD Designer software is organized with a system of tabs for navigation. By virtue of these navigation tabs, the user creates items called *cues, themes,* and *parameters*. Cues are essentially trigger buttons used to activate music tracks according to predefined interactive variables. Themes serve as a workspace wherein we import the music files and create transitions from one track to another. Parameters, known more fully as Real Time Parameter Controls, are representations of gameplay events that have a direct influence on the music—we can define these interactive characteristics in FMOD Designer by linking specific music behaviors with corresponding gameplay variables. FMOD Designer's music system is slightly less robust than that provided by Wwise, but the graphical interface provides an ease of use that has the potential to speed workflow. While the documentation accompanying the FMOD Designer application is not as comprehensive as that provided by Wwise, the staff at Firelight Technologies are very quick to respond to questions and concerns regarding their software. As of this writing, Firelight has just released a brand new version of their software. In both its appearance and user interface, FMOD Studio is even more similar to the DAWs we all know so well. The accompanying documentation for FMOD Studio does not yet include any information or instructions in regard to using the music capability of the software, although the promotional brochures promise that FMOD Studio offers far more powerful music features than FMOD Designer does.
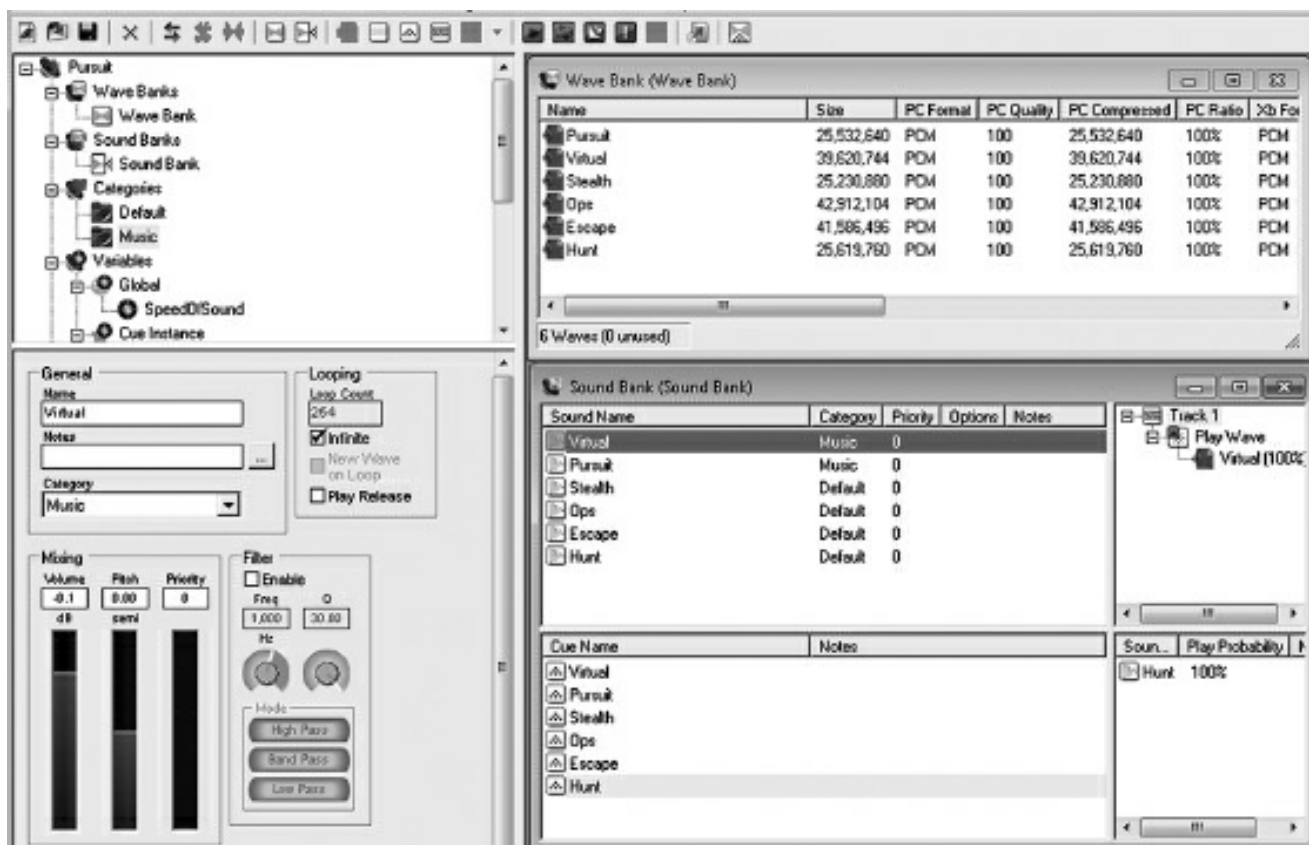
Figure 13.3
XACT, developed by Microsoft.

XACT stands for Cross-Platform Audio Creation Tool. Developed by Microsoft, this software is specifically designed for creating interactive audio for the Xbox console and for the Microsoft Windows operating system for PCs. XACT provides tools for the organization of sound files under the categories of *banks, cues,* and *global settings*. Banks serve to provide a place to store music files, which can then be assigned to a cue object that will allow them to be triggered for playback. Global settings are rule sets that can be assigned to the music files, including interactive behaviors in response to specific game parameters. This structure enables the music files to be organized in an interactive system. Unlike Wwise and FMOD, XACT can't be used to create audio for a variety of game devices. The singular focus on the Xbox and Windows PC systems may limit the usefulness of the software for the development of games that are intended for many different devices. This specialization, however, allows projects developed with XACT to be implemented across Microsoft platforms with ease. While the software may not be as fully featured as FMOD or Wwise, it has a long history of successful use in games. In fact, because of its relative simplicity, XACT may be a good choice for a beginner.

Familiarity with audio middleware is a useful skill. At the very least, it affords us valuable insight into the process by which our music is incorporated into game projects. In my experience, most development teams prefer to handle their own audio implementation. However, in the case of smaller development teams lacking dedicated audio personnel, a composer who is familiar with middleware can enjoy an advantage when auditioning for a game music position.

Surround Sound

As a medium through which to deliver gameplay information to the player, surround sound is invaluable. It can alert players to the location of enemies, add deep levels of realism and ambience to environments, and contribute in a profound way to the overall immersion of the experience. This contribution depends on creating a realistic connection between the sounds heard through the surround sound system and the world created by the game. With this in mind, music is not always a good fit with video game surround sound.

When watching a movie, audiences are accustomed to hearing a dramatic musical score that offers emotional commentary on the action. No one makes the assumption that the fictional characters in the movie can actually hear the dramatic underscore, even if the music is completely encircling the audience in an elaborate surround sound mix. However, because of the interactive nature of the video game format, players have a very different reaction. When

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musical sounds originate from distinct locations along a 360-degree radius within a video game, such precise positioning gives the strong impression that the music exists in the fictional world and that the player's in-game character can actually hear it. Unfortunately, this means that the content of a musical score may be confused with sound effects emanating from the fictional world, causing some negative effects.

As an example, players may suddenly confuse a snare rhythm with gunshots, prompting them to turn their game character sharply in the direction of the sound in order to protect themselves. Momentary confusion such as this can break immersion, and also has the potential to distract players and cause them to incur damage. Music should never interfere with gameplay. This may be a big reason why surround sound background music has not been employed significantly in video games.

Conversely, if the developers intend for the music to be perceived as a literal part of the in-game environment, then it may be successfully incorporated into the surround sound mix. For instance, tunes from a jukebox in a bar would logically emanate from that position. In a first-person or over-the-shoulder third-person perspective, the position of the jukebox music may shift across the 360-degree radius as players move their characters around the room.

One of the tracks I wrote for *God of War* is a good illustration of this technique. While in the desert, players are required to follow the sound of a singing voice to its source and then engage the singer in a battle to the death. This is loosely based on the ancient Greek myth of the Siren, who lured men to their deaths with her singing. I composed a hypnotic theme for the deadly Siren, which was then implemented into the surround mix as though it were a sound effect springing from that character. Players begin to hear a faint singing through the wailing of the desert winds and are required to carefully follow the sound. Heading in the wrong direction makes the sound fade away. As players draw closer to the singing, it grows clearer and more pronounced. They can judge their positions relative to the Siren based on the location of the singing on the 360-degree radius of the surround mix.

Technology Shopping

Now that we've examined how technology will shape our creative output and reviewed our possible equipment needs, let's start thinking about how to successfully shop for them. Depending on our available budget, we can either plunge directly into a full-scale procurement of all the gear on our wish list or we can start slowly with only the most vital products (such as a computer and a DAW). I started building my studio when I was in my teens, and this allowed me to ease into the process over a number of years. I didn't enter the game industry immediately. Instead, I had the opportunity to work steadily as a composer for radio while I was making my studio as technically advanced as I could. This meant that I didn't have to compete for game jobs until my studio was ready for it. One of the hard truths about our chosen profession is that competition is fierce in the game industry, and technical quality can help a composer rise above other contenders and secure paying work.

The first step in successful shopping is research. In this task, the Internet is our friend. We can visit websites devoted to the gear that interests us and then seek out product reviews from music technology journalists. After that, we can visit bulletin boards populated by gurus of music tech and see what verdict has been handed down about our prospective purchases. With this knowledge in hand, we can then proceed to vigorously comparison shop.

Hardware and software manufacturers are always working hard to invent new products that will inspire us. These companies will fall all over themselves in the effort to impress us with their innovative breakthroughs and must-have features. They'll tell us that if we use their products, we can achieve the very best results possible, easily and automatically! Listening to these product pitches, we may almost believe that the gear will write the music for us. While we shouldn't blame the manufacturers for their enthusiasm, we should take all of their claims with a liberal dose of skepticism.

First and foremost, we must trust our ears before we spend our money. Audio demos are invaluable ways for us to evaluate the quality of a music technology product. The best audio demo provides a clear and uncluttered way to audition the product and see how it operates. Such a demo should not be a glossy and heavily produced commercial recording involving multiple products in addition to the one ostensibly being demonstrated. These sorts of audio demos do not allow us to perceive the kind of fine details that we need to hear when we are making such a decision.

We also shouldn't forget to consult our musical instincts when we are evaluating products for our studios. After all, our own creative sensibility is our best and most marketable asset. Without it, we would have neither the talent

nor the inclination to embark on the long journey toward becoming a successful game composer. We rely on our instincts during the process of music creation, and we should make thorough use of them when shopping for gear. Music technology manufacturers will tell us that their products will make an "amazing difference" in the sound of our music. It can be tempting to let the sales pitch cloud our judgment, in the hopes that this thoroughly hyped product will give us a competitive edge. In the end, though, if *we* can't hear the "amazing difference," then we don't need to buy the product. We should never doubt our own ears.

Another danger on the road to gear ownership may be our own love of gizmos. Manufacturers know that we love these toys, and they design their products to be as sleek as luxury cars and as pretty as smart phones. User interfaces may feature attractive icons and menus that tease and beckon us to plunge deep into a fascinating world of choices and possibilities. But if the product's fascinating world is so complex that it has the possibility to slow down our workflow, we should consider it a red flag.

My personal philosophy is that if a piece of technology stimulates my musical creativity, I'll be open to buying it. But if it seems more geared toward my inner audio engineer, I'll keep my money in my pocket. I don't want to be spending hours tinkering with a piece of gear. Technology should do its job and stay out of the way. That being said, if I find a piece of software or equipment that is capable of delivering something I desperately want for a project, I'll be willing to spend an inordinate amount of time finessing and fiddling with it. I own one software application that shall remain nameless and that I regularly curse to the skies. It has an unintuitive interface, unpredictable operation, and a tendency to crash. Despite this, I still use it because I love the sound, and there's nothing else on the market like it. This doesn't mean that I'm not keeping a watchful eye for a replacement, though.

As a final thought on technology's place in our creative lives, let's consider the words of transcendentalist philosopher Henry David Thoreau. Offering an interesting perspective on the technology of the nineteenth century in his book *Walden; or, Life in the Woods,* Thoreau (1854) warned that people had become "the tools of their tools." As composers of the twenty-first century, we may need to remind ourselves of Thoreau's warning from time to time. While it is important for us to wholeheartedly embrace the technology that is shaping both music production and video game development, let's not get carried away. We don't want to be the tools of our tools. We're artists first, and the creation of music is our foremost concern. Technology should ease our way and offer us inspiration and support without ever distracting us from our goals.

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Acting Like a Business and Finding Work

Before I got my big break in the video game industry, I'd had a very bleak year. In that time, I'd created music for three games that never saw the light of day—a robot fighting game, a massively multiplayer role-playing game, and a futuristic total-conversion game mod. All three projects were canceled. Having thrown all my creative energies into these unreleased games, I was feeling particularly dejected. As a last ditch effort, I decided to write a letter to the music director at Sony Computer Entertainment America. This was something of a Hail Mary pass considering how important this music director was in the industry, and how unlikely it was that such a high-powered executive would pay any attention to a composer with no real video game credits. Nevertheless, I believed in my own abilities as a composer. I fiercely wanted to pursue a career in the game industry. Desperate times called for bold action, so I wrote the letter.

I kept it brief. In a hundred and six words, I expressed enthusiasm for Sony's game projects, communicated my composition experience in a starkly streamlined way, and asked to be considered for future music needs at their company. As it turned out, I got lucky. The music director forwarded my information to one of the members of his team—a music supervisor overseeing one of Sony's game projects. This was an open door for me. As a newcomer, I knew how rare an open door like this could be. It was crucial that I vigorously pursue this opportunity. The music supervisor let me know that he was interested in hearing some of my music, so I immediately sent some music files as e-mail attachments. I also simultaneously mailed the same music files to him on an audio CD. Also, I asked if he'd be attending the upcoming Electronic Entertainment Expo (E3) in May, and if we could schedule a business meeting during the convention.

I'd never been to E3 before. As an East Coast composer, I'd never been to Los Angeles before, where the convention annually takes place. However, I had a feeling that an opportunity like this would not be likely to happen again, so I should do everything in my power to take advantage of it. After hearing my music, the music supervisor told me he liked what he'd heard and he wanted to meet with me on the expo floor of the convention center in a few weeks. I remember thinking, *well, I guess I really am going to LA now.* Then I started frantically making travel arrangements.

As a video game fan, I thought I was fairly well acquainted with gamer culture. I subscribed to video game magazines. I read about the industry on Internet forums and websites, and I'd seen a few photographs of industry conventions. None of this prepared me for the reality of E3. On that dazzling sunny morning in downtown LA, I joined the crowd of expo attendees streaming past the military helicopter parked outside the convention center as a promotion for an army game. We all traversed a lobby reminiscent of an airport hangar, passed beneath banners adorned with purple dragons and green-skinned aliens, climbed a staircase plastered with the enormous image of a cerulean mermaid, and then plunged into the thunderous darkness of the expo floor. I had barely enough time to mentally process the sensory overload before I had to quickly orient myself and hurry to the meeting at the Sony booth.

Despite the spectacular and sometimes outrageous nature of the games they make, most developers I've met tend to be low-key and soft spoken. This was the case with the music supervisor from Sony, who led me through the crowded booth to show me his current project in action. It was actually hard to miss the row of monitors running the game because a gigantic statue of the game's main character hung over it. Looking up, I saw a bald, muscled warrior holding an enormous, blood-smeared sword in one hand. In the other, he held a decapitated head. Above all this was the name of the game in fiery letters: *God of War.*

I hadn't heard of the game before, but this wasn't unusual. The game hadn't received significant press before this convention, which was to serve as its "coming-out party." Watching one of the screens showing *God of War* gameplay, I saw a Spartan warrior battling hordes of undead Legionnaires while simultaneously traversing a rope hand over hand above a bottomless chasm. It looked like fun.

One of the inescapable truths about E3 is the inability to hear any sound from the games being demonstrated—such is the deafening roar radiating from every booth on the show floor. I was able to see what *God of War* looked like, but I had no idea what it sounded like. For that, I relied on the music supervisor's descriptions as he told me what his music goals were for the project. The development team had planned to hire a group of composers, and my composition skills might make a strong contribution to the musical score. Would I be willing to immediately start writing music for the project, at first speculatively (as an audition for the job), and then hopefully as an official part of the team? Of course, my answer was a resounding *yes*.

So, with this trip to Los Angeles, I had secured an audition for a major video game project. All this was very good, but I also knew that an audition was by no means a firm commitment. Fortunately, I'd made sure to do some additional research before I left for LA. In the days before the convention I'd quickly contacted some smaller developers who would also be showing games at the expo, and they were willing to meet with me to talk about music needs for their future projects. Having arranged this ahead of time, I was able to increase my chances of finding work.

Of this handful of meetings, one seemed promising. My conversation with the audio director of High Voltage Software focused on a game in early development. Since it hadn't been announced yet, he couldn't tell me anything about it. Nevertheless, I took the opportunity to let him know about my past experience as a composer in other fields, and answered his questions regarding my working methods. We parted ways with a promise to follow up with each other after the conference.

Returning home, I immediately got to work on the tracks requested by the music supervisor from Sony Computer Entertainment America. I also conscientiously followed up with the audio director from High Voltage Software, who soon requested some "audition" music as well. At this point, I knew there were two things I had to do very well—I had to compose outstanding music, and I had to be politely but doggedly persistent. So I did both of those things to the best of my ability. I submitted the best tracks I possibly could, and I followed up periodically with courteous e-mails that asked about the status of my submission.

The final result of all this persistence: two video game jobs. The first was *God of War* for Sony, which was released to enormous critical acclaim. The second was the *Charlie and the Chocolate Factory* video game for High Voltage Software, a tie-in to the Warner Bros. film. Tim Burton, who was also directing the film, personally approved all of my music for this game.

My experience landing my first game gigs taught me a lot about acting like a business. Since then, I've landed many more game jobs and established relationships with a diverse group of clients. Each new project has taught me more about the business side of my profession. As game composers, and particularly as independent contractors, we are obligated to see ourselves as a product that must be marketed effectively before it can be sold. Even though we are single individuals, we must act as though we are full-fledged commercial organizations. Therefore, we are required to cultivate advantageous business skills and present ourselves in a way that conveys our innate professionalism and diligence. Among the many skills we must master, these are perhaps the most important:

- Developing a strong writing style
- Learning to speak expressively
- Designing an effective website
- Conducting research and following leads
- Building a database of contacts
- Cultivating personal relationships
- Growing a thick skin
- Keeping records and following up
- Exceeding expectations

In order to build a successful business, we should endeavor to develop these abilities in ourselves. It is always an ongoing process, and each new project provides many opportunities for us to put these skills to use and hone them through experience. Let's explore each one and discuss how each applies to our lives as game composers.

Developing a Strong Writing Style

Perhaps because of their high comfort level with communications technology, people in the video game industry are accustomed to communicating with each other in short, casual bursts. They send instant messages, post brief thoughts on bulletin boards and social networks, and text each other's smart phones. In terms of written communication, they value messages that deliver the necessary information in as few words as possible. In our business writing, we should try to merge the blunt pithiness that typifies such messages with a slightly more formal writing style that expresses our professional competence. In doing so, we should keep in mind that the video game industry is home to an anti-establishment culture, which makes it resistant to formal writing. Our goal will be to balance the casual communication preferences of the industry with careful and strategic organization. Accomplishing this task can be most difficult when we are first reaching out to a new contact.

When we write an introductory letter to a prospective client, we tend to have a wealth of information we'd like to share. This information may include comprehensive lists of previous projects, descriptions of relevant skills and experience, and heartfelt declarations of our personal enthusiasm for the studio and its long history of quality game development. Giving in to the temptation to include everything is a casebook demonstration of the behavior for which the Internet acronym tl;dr ("too long; didn't read") was created. For this reason, we'll need to critically evaluate every word with the goal of achieving both brevity and precision.

If we've won a significant award, composed music for a noteworthy project, or received positive press from a recognized publication, we should definitely lead with this information. Our initial objective is to arrest the attention of our readers, giving them a reason to read further. We can augment this preliminary information with specific questions about music plans for upcoming projects, and then conclude with something optimistic, such as "I hope to hear from you," followed by our signature. Below this, we can append a few relevant facts about ourselves as a short bullet list. This should be no more than a few lines at most.

While correspondence needs to be succinct, other forms of writing can be a little bit more expansive. For instance, we'll all need to write a professional biography at some point. As one of the most overtly promotional documents we'll ever have to write, the professional biography often uses a writing style similar to that found in a press release. The opening paragraph lays out the most relevant facts and the subsequent paragraphs expand on those facts with additional supporting details. Professional biographies are written in the third person and tend to emphasize career highlights. While we'll certainly encounter biographies that also include childhood memories and humorous anecdotes, it is generally not a good idea to incorporate such personal information. In order to present ourselves advantageously to prospective clients, we need to create an impression of serious dedication to our craft.

Over the course of our careers, we'll have numerous opportunities to flex our writing muscles. We may work with clients who prefer to discuss their music needs via extended e-mail discussions. When auditioning for jobs, we may occasionally be asked to provide written descriptions of our proposed stylistic choices for an upcoming project. When submitting tracks during music production, we may wish to send e-mails that describe how our composition process adhered to the requests of the team. At the very least, we'll need to periodically add new written material to our websites (more on this later).

Also, as we begin to taste a bit of success, we may find ourselves writing for even more purposes. The public relations department of a game publisher may ask us to provide publicity information for an online article. Journalists may request that we supply answers to written interview questions. Our need for solid writing skills will only increase as our careers advance.

Learning to Speak Expressively

If our business writing needs to be fairly brisk and utilitarian, our speech can be much more personal and evocative. There are strong professional advantages to effective public speaking, especially in that it allows others to understand and appreciate our enthusiasm for music. This ability is particularly useful when we're speaking directly to our project supervisors or potential clients, either during face-to-face meetings or via phone calls, web conferencing, or voice chat.

As composers, we feel passionately about our jobs. This passion drives our daily workflow and inspires the creative decisions we make. Emotions such as this can be helpful to us when we're meeting with possible clients, but only when well controlled through a disciplined and organized presentation. Some of our prospective employers may appreciate raw enthusiasm, but this sort of eagerness also has the potential to scare some people off. What we

need is the ability to gracefully articulate our enthusiasm while at the same time impressing developers and publishers with our thorough professionalism.

Unfortunately, this is a skill attained only through practice. Those of us who are uncomfortable or fearful in such situations can look for opportunities to practice in a safe, consequence-free environment. For instance, helpful friends may volunteer to be an audience for us, applauding our strengths and drawing our attention to areas needing improvement.

Now, let's discuss a particularly important type of business discourse—the elevator pitch. This is a short speech designed for a limited time window. The name is derived from the time interval between entering an elevator and then exiting it when it reaches the desired floor. For instance, if we were to enter an elevator and then a prominent audio director from a large publisher were to step into that elevator soon after, we'd want to take advantage of the opportunity to speak with him or her in the limited time available to us, without succumbing to nerves. This is why it is important to write and memorize a short speech in which we describe our credentials in a friendly, laid-back tone. When attending a game industry conference, we must be able to efficiently introduce ourselves and list our qualifications at a moment's notice. Elevator pitches help us to network successfully. As we become more comfortable, we'll have less need to rely on a memorized speech, instead opting for a more off-the-cuff approach. But at the beginning, an elevator pitch can be a lifesaver.

Designing an Effective Website

Every composer needs a website. Like a bold sign posted over our virtual storefront, a well-designed website has the ability to provide a visual and conceptual identity for our business. Logos, icons, background textures, text, and layout all combine to form a fundamental impression of a composer's individuality, helping to define the composer both as an artist and as a commercial brand.

The best way to understand the construction of a typical game composer's website is to visit some representative sites and have a good look around. Some composer sites are outstanding examples of cutting-edge presentation and entertainment value. Others are simple, no-nonsense sources of information. Both approaches have their merits. An expensive-looking site will convey its high production values in the form of animated navigation and lots of multimedia content. A streamlined website will offer universal accessibility by virtue of its quick loading times, speedy navigation, and compatibility with all browsers and devices. Whether plush or modest, a good website should convey the desired message as clearly as possible.

Most composer sites stick to a proven formula. The first page that greets the visitor is almost always a vehicle for new announcements. The latest projects, soundtrack releases, and appearances are often described here in a format vaguely reminiscent of a blog. Other sections on the site may include the following pages:

• The *Credits* page contains a list of accomplishments, usually in reverse chronological order starting with the most recent. Other items that may be listed in this way include awards and commercially released soundtracks.

• The *Press* page focuses on any coverage received from journalists. Such coverage may include music reviews and links to interview articles.

• The *Bio* or *About* page displays a professional composer biography in a visually attractive way, usually accompanied by at least one photo of the composer.

• The *Gallery* page offers a photo collection focusing on images of the music production studio and the composer.

• The *Contact* page gives site visitors the opportunity to contact the composer, usually via an online form.

• The *Music* page presents several audio samples for online listening.

The layout and content of the music page is especially important, because our music page will sometimes serve as our online demo reel for prospective clients. We'll need to choose the selection of tracks very carefully, since publishers and developers may evaluate them when considering us for potential jobs. This is a time to think objectively about our musical style and how it fits the needs of games on the market today. Do certain tracks in our portfolios seem especially suited to video game use? These should appear first on the music page. Anything that can create a strong positive impression should be pushed up to the top of the page. We have a limited amount of time to

capture the interest of those people in the position to hire us. Every decision we make regarding our website must be strategic.

We don't have to be fluent in HTML (hypertext markup language) code or know our way around graphics applications in order to have a visually attractive website. Hiring a web designer is a good way to ensure that our site conveys crisp professionalism in every respect. When outsourcing the creation of a website, we should emphasize to the web designer the importance of building a user-friendly interface that will allow us to quickly update the site with new text and images. Our professional lives are always evolving, making it very important for us to keep our site up to date with the state of our careers, including current projects and any other music-related activities.

If we *are* comfortable with HTML and graphics, we can certainly design our own website. For a little head start, we can purchase a website template and then thoroughly customize it to our needs. Designing our own site allows us to have complete control, which includes the ability to make sweeping changes to the site whenever the need arises.

Conducting Research and Following Leads

Finding work in the video game industry often depends on a combination of vigilance and luck. While we can't somehow change our luck, we must always remain vigilant for potential employment opportunities. Unlike jobs in other areas of the video game industry, composer jobs are never publicly posted. Game developers and publishers have no need to solicit candidates for a music composition position because composers are figuratively lining up at all hours of the day and night, hoping to be considered for the next gig.

While it can be tremendously difficult to rise above this competition, there are two strategies that yield successful results for composers new to the video game industry. The first is for the composer to arrest the attention of key personnel at the company by virtue of some accomplishment that testifies to the indisputable quality of the services provided. Having impressive music composition credentials in another field (such as broadcast media or theatrical features) may serve this purpose, as can any accolade or testimonial coming from a source that a prospective employer would trust. The second method is to simply be a high-quality composer who just happens to show up at the right time. The only way to accomplish this feat is through a combination of extensive research and bold-faced tenacity. We must consistently read all the news coming out of the video game industry, making note of any information that seems promising. Press releases from publishers sometimes yield interesting tidbits of information, such as the formation of a new internal team for an unannounced project. Interviews with development personnel may occasionally include hints about future plans. With such information in hand, we can reach out to these companies and ask educated questions about the music needs of particular projects and teams. If our timing and our research align correctly, we can put ourselves into the minds of decision makers at the moment when they are most likely to be receptive.

Admittedly, this can be labor intensive. Also, this method may initially expose us to a good deal of rejection as we approach companies that may hesitate before considering a composer previously unknown to them. Fortunately, we live in the information age. Research can continually give us new directions to pursue. With this in mind, we're really limited only by our own perseverance.

Building a Database of Contacts

We all want to work for nice people whom we respect, and who respect us in return. When we have the great pleasure to work with such people, we should try our best to keep in touch with them. Unfortunately, the video game industry has a very high turnover rate. People in the industry tend to move from one position to another as studios are closed down, staff sizes are reduced, and companies succumb to financial woes. For instance, a producer who treated us well while working at one company might subsequently work at two or three different companies within the span of a few years, making it vitally important for us to keep track of these movements.

A game developer's life can be quite nomadic. Someone we first encounter as a member of a London team may relocate to New Zealand a year later in order to join a new studio there, and then perhaps take a new job in San Francisco a few years after that. If we enjoy a good rapport with this developer, then we'll want to preserve the

professional relationship, despite whatever employment changes occur.

Folding the task of preserving existing relationships into our general research efforts, we'll eventually amass a substantial list of names and contact information for people employed by development studios and publishing companies in the game industry. All this information can become very unwieldy, which makes it important to formalize everything into a database. While it's certainly possible to assemble a database using just a notebook and pencil, we're much better off with a software solution that gives us the capacity to easily revise information. Our database of contacts should have as much information as we've been able to collect, including names, job titles, company names, website addresses, and any contact details we've acquired. We can also include a location for recording miscellaneous notes that we may want to remember in the future.

Personal relationships can be one of our best resources for finding jobs. As our contacts shift from one company to another, we should do our best to adjust our information accordingly. Still, these adjustments can hit a brick wall when we unhappily discover that one of our contacts has suddenly joined the ranks of the unemployed. This is particularly bitter when the person in question was a consummate professional who treated us well, and whom we would dearly love to work with again. While we will have to remove the obsolete contact information from the database entry, we should hold on to the entry itself in the hopes that we can eventually reestablish the connection. People rarely stay unemployed forever, and it is likely that we'll eventually be able to add details for that person's new place of employment to our database. Connecting with people via online social networks such as Facebook and LinkedIn may also help us stay abreast of these changes.

If we conduct our research and collect relevant contact details long enough, we'll inevitably accumulate a respectable archive of valuable information. Our contacts database can be a powerful tool for our business.

Cultivating Personal Relationships

Beyond simple research, attending conferences can be a great way for us to introduce ourselves to the industry and add to our database of contacts. Only at such a gathering can we enjoy the benefits of a chance meeting. While it can be quite nerve wracking, we should embrace the opportunity to speak in person with someone in the position to consider us for future employment. With our elevator pitch memorized, we'll have a way to initiate the conversation. If all goes well, the chance encounter may turn into a productive dialogue. We may learn something about that person's company, and may even gain surprising enlightenment about the industry as a whole.

No matter how engrossing the conversation, we must always remember to exchange contact information. Investing in an attractive business card will help us to streamline this process. Our business card does not need to have a fancy design with a high-gloss finish. In fact, it's better for us to keep the design fairly simple, making sure that the back of the card is a white matte surface that can be used for jotting down notes. Contact information is certainly the most important content of a business card, but a brief statement about the nature of our business can also be included in the card's design. Such a statement can serve as a helpful reminder for those who might have forgotten who we are.

There are many benefits to be gained by attending conferences and other professional gatherings, but the most fulfilling experience can be found in the simple act of enjoying face-to-face meetings with human beings. As a high-tech industry, video game development has embraced every application and device that facilitates collaboration across distances. We e-mail, voice chat, instant message, and video conference. We send materials to each other via FTP and online media share services. With all these tools at our disposal, we can work successfully in the video game industry without ever setting eyes on our coworkers. Even so, our professional lives can be much richer when we connect with each other on a personal level. Making the pilgrimage to annual industry gatherings such as E3 in Los Angeles and the Game Developers Conference in San Francisco allows us to get to know each other and helps us to feel more connected to our community.

Growing a Thick Skin

As game composers it is important for us to develop a thick skin and take criticism with a smile. Cultivating this ability may be one of the most important ways in which we can contribute to the longevity of our careers.

There are many reasons why our music may receive criticism from the publisher or the development team, and

some of the reasons may not be directly related to the quality of our work. For instance, the team may be in a highly iterative mode, creating multiple versions of their game design. This can cause our music contribution to unexpectedly clash with new design elements, resulting in requests for revision. On the other hand, there may be members of the team who have strong negative feelings about particular genres of music or even specific musical instruments. These feelings may lead to requests for instrument removal or stylistic changes. Internal company conflicts may cause goals for the musical score to periodically fluctuate. It is even possible for a publisher or developer to completely change the musical style of a project, leading them to ask us to make significant alterations to our work. As game composers, we are often unaware of the internal motivations leading to revision requests.

Above all, we must learn not to take criticisms personally. When our clients ask us to make changes, they may not be rendering any sort of value judgment on the quality of the music we've delivered. They may believe that the music we've created is strong, beautiful work that unfortunately fails to "click" within the context of gameplay. Since it is often impossible to predict whether a musical choice will work within the larger framework of a game, we should expect to sometimes be asked to overhaul our submissions. Yet, even with all this in mind, it's still perfectly natural for us to get a little bit upset about criticism. These feelings are a part of our passion for our job. Every choice we make in the composition of a track is guided by our own unique musical aesthetic, and it can be a little distressing sometimes when these decisions are questioned. Nevertheless, it is crucial for us to learn to overcome these feelings.

Sometimes our best recourse is to absorb the critique and then mentally set it aside and do something else until it can be approached again with a sense of objectivity. Time can be a powerful ally, dulling our initial sensitivity and affording us the chance to consider the critique and better understand it. Those of us who work remotely as independent contractors will enjoy the slight emotional buffer inherent in working off-site. This can be helpful while we are digesting criticism. In the end, we may find that the process of reevaluating our work and restructuring it to meet different goals will also bring about interesting and unexpected musical effects. By listening to our music from a different perspective, we may broaden our skills and grow as artists.

Keeping Records and Following Up

In the absolute darkness of the deep ocean, submarines rely on several combined navigation technologies to help them find their way. One of the oldest of these methods is known as *active sonar*. It involves the emission of a noise called a *ping*. Traveling through the water, this noise will be reflected back to the submarine by any solid surface that it encounters. The reflections let the submarine know that there are other objects in the darkness around it. With this information, it can then measure the time the reflections took to return and use that measurement to calculate its distance from anything else in the ocean.

The word "ping" is also used in business communications. Existing in the metaphorical darkness created by a lack of contact with our colleagues and prospective clients, we occasionally must send out a ping. This usually takes the form of a short e-mail that contains both updates on our career developments and questions about activities at the studio or publisher. Traveling across the Internet, this ping will (hopefully) be reflected back to us in the form of an e-mail reply. With any luck, the reply will let us know that our colleagues are interested in working with us and may even give us a timeframe in which we should ping again.

As independent contractors, we are responsible for every aspect of our careers. This includes the continual maintenance of business relationships. In order to be successful, we must keep excellent records of our communications with both past and prospective employers and periodically follow up on any job leads we encounter. Pinging is a fairly common practice in the industry and as long as it is not used too frequently, it can be a very helpful way to reinforce our presence in the industry and remind our colleagues of the services we have to offer.

Some of us may find these sorts of ongoing tasks to be very distracting. Admittedly, there are a lot of responsibilities, from generating written materials and keeping an up-to-date website, to conducting business meetings and fostering long-term relationships, to researching job leads and building a database. All of these duties must be undertaken in the time we have available when we are not composing and recording music. When we add to this the need to periodically follow up with all our promising contacts, it may become too much for some of us to manage.

In these circumstances, we will need to think about building a team of assistants. Such a team may consist of a public relations representative, an agent, a webmaster, and any other professionals whose services can help us stay

on top of the business side of our careers. While the costs incurred by availing ourselves of such assistance may add up, for some of us it will be a necessary expense. On the other hand, having such a support system is not a choice that works for everyone. PR reps, agents, and webmasters typically have many clients and are often too busy to give their clients specific information about the efforts made on their behalf. For those of us who tend to be rigorously hands on, with a need to know the details of what's going on with our careers, this situation can quickly become an exercise in frustration. The decision about whether or not to assemble a support system is therefore a very personal one.

Exceeding Expectations

Everything we do, both as composers and as business professionals, should be motivated by a desire to rise to a level of excellence that our clients would never have anticipated. We should want to constantly astonish them, not only by submitting fantastic music but also by meeting every deadline with meticulous professionalism, treating every team member with heartfelt respect, and managing the logistical aspects of every project with painstaking care. From the first introductory letter to the last project milestone, we should strive to exceed expectations.

I've found that what I learned while landing my first video game job has remained true throughout my career. In order to succeed, it has always been vital to compose outstanding music and to be politely but doggedly persistent. That persistence extends to every aspect of our careers as game composers. From conducting research and making professional connections to building a database of contacts and following up on promising leads, we must respectfully but tenaciously pursue our goals. We should do our best to deepen our understanding of the culture of our industry so that we can write and speak in a style that will best communicate what we have to offer. Coupling these modes of communication with a thoughtfully designed website will complete the public image that we present to the game development community. Our professional identity will act as the package that delivers the product we are selling: our ability to compose great game music.

It can be challenging to continually promote ourselves. In those times when we get a bit exhausted by it all, we can think about the intrinsic joys of composing music for games and participating in a phenomenally creative endeavor fueled by the enthusiasm of a brilliant community of people. With that firmly in mind, we can forge ahead, creating the best music we possibly can and making sure that the industry knows what we can do.

Conclusion

Every now and then, I'll find myself thinking back to my "eureka" moment when I realized I wanted to be a game composer while playing the original *Tomb Raider*. Those mental images are colored by the rosy hue of fond remembrance, but since then, nine *Tomb Raider* games have been released, with more soon to come. The level of increasing sophistication continually amazes me.

Modern video games have the capacity to inspire us with awe and wonder, immersing us in worlds that exist only in the developers' imagination and letting us amass experiences that we couldn't have in any other way. Some offer joyrides for the child inside of us, and others challenge us with commentary on the human condition. As game composers, it is our privilege to create music that helps these games entertain, amuse, excite, and sometimes even provoke conversation and stimulate ideas, much like a work of art.

In chapter 10, we mentioned film critic Roger Ebert's belief that video games can never be art, with a promise that we'd eventually be discussing his assertion in more depth. Now, as we conclude our exploration of music in video games, let's take a closer look at what Ebert was trying to say and see if his concerns have any bearing on our work as musical artists in the field of interactive entertainment.

Games as Art

As a Pulitzer prize–winning journalist who was named "the most powerful pundit in America" in 2007 by *Forbes*, Ebert wrote frequently about video games (Riper 2007). In these articles, he repeatedly states that the inherent nature of video games precludes them from ever achieving the status of art, saying that "Gamers have a prejudiced view of their medium, and *particularly* what it can be. Games may not be Shakespeare quite yet, but I have the prejudice that they never will be. . . . The real question is, do we as their consumers become more or less complex, thoughtful, insightful, witty, empathetic, intelligent, philosophical (and so on) by experiencing them? Something may be excellent *as itself*, and yet be ultimately worthless." In this way, Ebert contends that video games do not enrich us as human beings. And yet, because Ebert freely admitted that he did not play video games himself, we must consider his conclusion to be unreliable. Even so, let's take a closer look at the implications of Ebert's initial question —what is it about a work of art that makes it so intrinsically enriching? Are video games capable of delivering similar experiences?

We can find the beginning of an answer in the form of a unique exhibit hosted at the Smithsonian American Art Museum in the spring of 2012. "Video games are a great grassroots expression of culture and in some cases art in our democracy," remarked Betsy Broun, director of the Smithsonian (Stahl 2012). She was describing the video game exhibit at her museum, the first of its kind. "Art reflects life," Broun said. "You'll find in the games that there is oftentimes a deeper message." The National Endowment for the Arts also shares this sentiment. As an agency of the United States government that provides funding for projects exhibiting artistic excellence, the NEA began accepting grant applications for "interactive games" in 2012 (Funk 2011).

Perhaps most important, in a landmark Supreme Court decision in 2011, video games were finally awarded the First Amendment protections that are reserved for works such as books, films, plays, and all other forms of expression commonly classified as art. "It isn't every decade that a new form of media officially joins the spoken and written word as a member of the special class of protected endeavor we consider vital to the functioning of pluralistic, democratic society," writes *New York Times* critic Seth Schiesel (2011). "The court has ruled that games are art. Now it is up to designers, programmers, artists, writers and executives to show us what art they can produce."

Philosopher Aaron Smuts of the University of Wisconsin had already expressed a similar sentiment in his 2005 article for the *Journal of Contemporary Aesthetics*. "Recent developments in the medium have been widely recognized as clear indications that some video games should be regarded as art works," Smuts writes. "Several recent games have reached levels of excellence that exceed the majority of popular cinema. The potential of the medium seems clear: good if not great video game art is in the near future."

However, Ebert (2005) suggests that a work of art is an expression of inspired intellect governed by what he calls "authorial control"—something he perceives as lacking in interactive entertainment. Furthermore, Ebert seems to imply that games have not enjoyed the benefit of inspired contributions by great artists. "To my knowledge," Ebert writes, "no one in or out of the field has ever been able to cite a game worthy of comparison with the great dramatists, poets, filmmakers, novelists and composers." Since Ebert did not play games, we can discount his condemnation of them as an opinion born out of inexperience with the medium, but his viewpoint on the importance of the contributions of inspired artists is worth considering. "I tend to think of art as usually the creation of one artist," Ebert (2010) writes. "Yet a cathedral is the work of many, and is it not art?"

A video game is also the work of many, and I believe that there are numerous examples of video games that have shown the qualities inherent in the concept of art. A video game is the fusion of earnest and inspired creative contributions from writers, designers, producers, programmers, audio artists, and composers. Their creations, combined into a single interactive work of art, *can* urge gamers to be more intelligent, insightful, empathetic, and thoughtful. Together, video game creators can present meaningful game experiences that both challenge and surprise us.

As game composers, we have the responsibility to aspire to an ever more meaningful level of artistry in our music. The more ambitious and fearless we are in our craft, the more we can help video games reach that level of emotional resonance that defines the nature of true art.

Providing a definition of what constitutes "art," Ebert (2010) tells us that it "improves or alters nature through a passage through what we might call the artist's soul, or vision." So, for Ebert, in order for a creative work to be classified as art, it must be a reflection of the artist's soul. We may not agree with Ebert's denunciation of video games (he simply never truly experienced them), but as game composers we can appreciate his viewpoint on the nature of art. Those of us who create music for games do so with the determination to express our creative vision within the artistic medium we love so well. This makes us no different than the thousands of other consummate artists who populate game development teams around the world. All of us pour our creativity, our passion, and, yes, our souls into the games we spend our lives creating.

Lincoln University lecturer Grant Tavinor, author of the book *The Art of Videogames,* writes, "Are video games art? My answer is yes. But they are also a transformation of our concept of art, and as such art itself will never be the same again" (2010). Ebert clearly viewed this new form of creative expression with considerable doubt, but we should remember that he didn't enjoy the benefit of exposure to games from an early age. Many of us grew up with the same heartfelt love for video games that Ebert felt for films, plays, poetry, novels, and music.

Hearing the music of *Tomb Raider* at a young age woke me to the realization of a possible career path, and I'm sure that many others could relate similar stories of how their love for a particular game guided them toward their chosen profession. As we've learned, the life of a game composer can be immensely rewarding, but the rewards come only when we are unswervingly committed to our art, no matter how difficult circumstances may become along the way. I hope that this book has given you an understanding of some of the challenges and joys that fill the life of a video game composer.

A Composer's Guide to Game Music

At the beginning of this book, we imagined that we were navigating the maze of the video game profession together, traversing the twists and turns of a complex but rewarding career. *A Composer's Guide to Game Music* is an expression of my experience in this wonderful, eccentric, passionate industry. As your tour guide, I wanted you to see the world of video game development through my eyes. I hope you found it enlightening, and perhaps it may inspire you to plunge ahead into your own game music careers.

If the definition of art is a work that is filled with "the artist's soul, or vision," as Ebert puts it, then we as composers have a unique opportunity. Through our music, we can pour our own vision into the fabric of a video game world. Joining the creative spirit of the designers, artists, producers, programmers, and sound teams, we as composers can help a video game to become art. We can meaningfully contribute to one of the newest and most uniquely powerful forms of human expression.

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