CHAPTER 12

THE ORIGINS OF MUSICAL STYLE IN VIDEO GAMES, 1977–1983

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In his 2004 monograph Videogames, James Newman suggests several possible reasons why academics to date had ignored video games as an area of serious study. The most important among these reasons are, first, that video games were seen as a children’s medium, as something trivial and cartoonish, and, second, that since the games are part of mass culture, they must necessarily lack sophistication, gravitas, and intellectual legitimacy.  

Surely scholars of popular music, and film music, can recognize some of these objections as being similar to the ones that must have played a role in why, for instance, the study of music in animation has taken so long to join the study of music in other media genres like the science fiction film, documentary film of persuasion, or horror film, to name but a few of the types of motion picture whose music has been treated with scholarly rigor in recent decades. Unsurprisingly, however, given the ubiquity of video games, a robust scholarly discussion has recently begun to coalesce around the question of their particular strategies of rhetoric and representation. For some scholars, such as Gonzalo Frasca, the save/die/restart element of video games (in which a player figures out how to succeed in a video game by repeatedly failing and retrying a section of the game) may be another trivializing factor. Other scholars (like Newman and Ian Bogost), however, have recognized in the save/die/restart model a powerful new rhetorical mode that allows what some regard as the exploration of regret.  

In the time since Newman’s book appeared, the reality of video game study within the academy may no longer be viewed with such a raised eyebrow. Certainly the field that has emerged around video game studies has made tremendous strides, even as a growing (and much discussed) rift appears to have formed between the narratologists, who tend to borrow more liberally from the theories of film and narrative studies, and the ludologists, who seek to foreground the activity of play in their analyses. For such a young field of study, it is gratifying and perhaps telling of the state of sound and media studies that several significant works of scholarship—in particular the writings of Karen
Collins, Axel Stockburger, and Kiri Miller—have already appeared that address the way sound and music work in video games.3

Collins’s writings have done the field an especially huge service in her wide-ranging research on the techniques and technologies behind the music throughout the history of video games (see in particular her 2008 monograph, Game Sound: An Introduction to the History, Theory, and Practice of Video Game Music and Sound Design, as well as the 2008 essay collection she edited, From Pac-Man to Pop Music: Interactive Audio in Games and New Media). Among other things, Collins’s Game Sound offers a much-needed survey of music throughout the history of video games, and she takes great care to explain many of the technological particularities that have played such a key role in what has been possible in video game music.

Yet with such a massive topic, one that encompasses such a wide range of issues as well as a large and growing number of texts, much work remains to be done, not the least being closer investigation of the stylistic distinctiveness that occurs in the history of video game music. Indeed, a specter haunts early video games—the specter of early film music conventions, as filtered through the practices of some cartoon music. In particular, the stylistic development of music in video games from the late 1970s and early 1980s loosely paralleled the growth of music in early cinema, adopting many of the same strategies for fitting music to screen action.4

**Factors Affecting Early Video Game Music**

This chapter will consider games principally from 1977 through 1983, the year regarded by most video game enthusiasts and historians as the year of a great crash in the video game market, and it will dwell principally on coin-operated (coin-op) arcade games because these games had the most complex graphics and gameplay reaching the widest market. Key triggers to this crash included a disastrous home release of the highly popular game Pac-Man for the Atari 2600 home unit, followed a few months later with another disappointing Atari game, this time one based on the film E.T.: The Extra-Terrestrial (1982); it is widely believed that Atari buried piles and piles of unsold E.T. game cartridges in a New Mexico landfill (Kent 2000, chap. 14). Understanding that some uncertainty exists regarding just what might be the first video game, and also being aware that the first coin-operated game to be commercially released appeared in 1971—Computer Space (Nutting), a flop that nonetheless makes a brief cameo in the 1973 dystopic film Soylent Green—I will begin my discussion of video game music six years after Computer Space, in 1977, with the appearance of a game called Circus (Exidy).5 One of the very first games to incorporate recognizable melodies into its accompanying sounds, Circus requires the player to move a springboard back and forth as clowns bounce off it and up into three rows of balloons (see Figure 12.1).
A falling clown must be greeted with an empty springboard spot or else have a harsh encounter with the ground. *Circus* was promoted in part on the distinctiveness of its music: a flyer advertising the game to arcade operators touted the fact that “when the clown bursts the last balloon in a row, he hangs there momentarily as appropriate ‘award music’ is played.” The same advertisement explains that “if the clown misses the board, he tumbles and falls, and appropriate music is played.” The “award music” is a monophonic version of the popular and peppy late nineteenth-century music hall song “Ta-ra-ra Boom-de-ay” (1891), while the “appropriate music” for the dead—or at least temporarily flattened—clown is the opening melody of the third movement of Chopin’s Second Piano Sonata, the familiar funeral march of early film music. Why these particular melodies were chosen raises several questions whose answers start to come into sharper focus as more games began to incorporate music in their soundtracks.

The earliest coin-op video games employed sounds, but only at a basic level of white noise (for an explosion) or the strident bleeps and blurs that easily drew the kind of casual dismissal one can sense in the *Time* cover story of January 18, 1982, “Gronk! Flash! Zap! Video Games Are Blitzing the World.” *Computer Space*’s soundtrack did not even have “gronks” or “flashes,” or at least not melodic ones, for all of its sounds were sound effects attempting to bring a sense of realism to this descendent of the *Spacewar!* game (Steve Russell, 1962) where one controlled a spaceship maneuvering around a two-dimensional plane while attempting to shoot the other player’s spaceship. Promotional flyers for *Computer Space* explain how “the thrust motors from your rocket ship, the rocket turning signals, the firing of your missiles and explosions fill the air with the sights and sounds of combat,” while another advertisement (for the second-generation version of the game that featured a two-player option) boldly trumpets its “SPACE BATTLE SOUNDS—Rocket and thruster engines, missiles firing, explosions” as a selling point.

*Pong* (Atari, 1972), the coin-op much more successful and famous than *Computer Space* and thus incorrectly thought by many to be the first arcade video game, produced two simple electronic tones (heard by some to be an appropriate “ponging” sound): a B♭ each time the paddle (represented on screen with a rectangle) hits the ball (a small square), a B♭
an octave lower each time the ball strikes the wall, and a B a half step higher each time the ball makes it past a paddle and scores a point. A computer designer who worked on *Pong*, Al Alcorn, has explained how he had been asked to create the sounds of a roaring crowd when a point was scored, but because of the severe technical limitations, he gave up on that idea and instead “poked around the sync generator to find an appropriate frequency or tone. So these sounds were done in a half a day. They were the sounds that were already in the machine” (Kent 2000, 34). As with many of these 1970s video game soundscapes, there is an aleatoric and minimalistic quality to the rhythmic surprises of *Pong*’s severely limited pitch collection.

With roots in pinball machines, slot machines, and other arcade machines, arcade video games are the inheritors of a rich sonic tradition that dates back well into the nineteenth century. The sounds and ballyhoo music of these machines form an important part of the foundation for the soundworld of the video game arcade between 1977 and 1983, and this point brings attention to the function of music and sound in attracting and retaining players to play a particular game. If music were to be deployed for this function, it would need first of all to be loud to be effective, for it would often be but one machine among many competing for players’ quarters. When the sounds contained melodies, more often than not they were familiar melodies; when music was used in early video games to express information about play or about story, it needed to communicate quickly and to as wide an audience as possible. Because the programmers of these early games were often the sound designers as well as the composers, they may have been more inclined to use preexisting melodies because of an inability to write their own. While some video game designers appear not to have considered the possible copyright infringement that could happen in a game’s soundtrack—see for instance the game *Vanguard* (TOSE, 1981), which opens with Jerry Goldsmith’s main theme from *Star Trek: The Motion Picture* (1979) and whose power-ups are accompanied by Vultan’s theme from *Flash Gordon* (1980), all without any apparent acknowledgement of an existing copyright on those melodic themes—there must have still been a practicality to using musical works whose age would put them in the public domain and thus render them inexpensive to employ.

Zach Whalen’s useful 2004 effort at developing a theory of videogame music (“Play Along: An Approach to Videogame Music,” Whalen 2004) asserts that “early cartoon music and horror films established certain tropes that videogames rely on today.” Whalen draws attention to the close correspondence in some games between player control and musical gestures, finding a correlate of “mickey-mousing” in something like the ascending octave leap that accompanies any of Mario’s visual leaps in the highly popular and influential game, *Super Mario Brothers* (Nintendo, 1985), initially released in the United States on the Nintendo Entertainment System. Similar mickey-mousing had appeared earlier, however, with Mario’s first appearance in *Donkey Kong* (1981), as each of Mario’s jumps over a barrel results in a short melodic phrase that moves quickly from lower to higher to lower pitches. Although Whalen’s examples (*Super Mario Brothers*, *Legend of Zelda: Ocarina of Time* [Nintendo, 1998], and *Silent Hill* [Konami, 1999]) support his argument, the number of what he calls “ancestral forms” extends beyond just two: musical accompanying practices for films from the 1910s—musical practices that
would also have led into Whalen's two primary genres of cartoon and horror—appear in some of the earliest video games with music.

Although it appears that most of the programmers may not have been terribly creative or innovative composers, that they were able to include any sound and music at all is nothing short of a small miracle given the primitive computing technologies of the 1970s. Memory was severely limited and, as with early cinema, sound and music were often treated as secondary in importance after the visual elements. When the Atari 2600 Video Computer System (VCS) was released in October 1977, it brought into millions of homes joysticks and an MOS Technology 6532 chip that contained the machine's memory of 128 bytes of RAM.® *Combat* (Atari, 1977), a game included with every VCS unit and based on an earlier arcade game called *Tank* (Kee Games, 1974), contained no music per se but only rudimentary sound effects created with white noise: low rumbles for the tank; higher rumbles when the tank moved; a firing burst; and an explosion upon a successful hit (see Figure 12.2). Other home systems, such as the Bally Astrocade, had more powerful computing capabilities, and they also had relatively more sophisticated sound and music as a result. In 1978's *Gun Fight* (Bally Astrovision)—the video game equivalent of *The Great Train Robbery* (1903) and its significant place in film history?—the two players in the shoot-out receive a melodic signal whenever one of their gun-toting avatars takes a bullet: the Chopin funeral march sounds for one player's demise, while “Taps” plays for the other (see Figure 12.3). Both melodies come from the tradition of film accompanying that scholars can document to the 1910s and 1920s, as a number of film accompanying manuals and mood books have both the Chopin funeral march and also “Taps” among their offerings for funereal scenes. By 1977, *Circus* was appearing in arcades and presenting its two simple, and highly touted, melodies, one of them the Chopin funeral march.

It would not be long before programmers of the Atari VCS also began to introduce musical gestures into their games for their home systems. Atari's 1979 version of *Adventure*—a game that had emerged from Will Crowther's 1975 interactive fiction (or text adventure) also titled *Adventure*—has been discussed by scholars like Mark J. P. Wolf (2001) in connection with its remarkably innovative reconceiving of space, in the way that it allows the character (represented by an avatar of a simple square) to move

to the end of one screen and then appear at the other end of the next screen, creating an illusion of continuous space (and in this game, even some non-Euclidean spaces). Musically, however, this game also looked ahead to the kinds of mickey-mousing present in Super Mario Brothers, for whenever the character avatar picked up or dropped an object, a quick ascending or descending melody sounded (see Figures 12.4a, 12.4b, and 12.5). A similar use of music as a signal to a player’s action occurs in Atari’s 1981 Haunted House, an ancestor to later survival horror games, in which an avatar consisting of a synecdochic pair of eyes (Figure 12.6) navigates an unlit space and where every ascent up a staircase gets coupled with a three-note pitch collection whose acrid chromatic sound is similar to that of the well-known Viennese trichord of atonality: in the labeling method of pitch-class set theory, it is [0, 3, 4], and the Viennese trichord is [0, 1, 6]. Descending the staircase brings the same three pitches with a more hesitant rhythm (see Figures 12.7a and 7b). Traditions of using dissonance and disjunct melodies as a way of creating feelings of fear and unease reappear here, although they are offset by the whimsical character of the game’s visual iconography. In these early examples of home games, the player may be positioned in a kind of unconscious fantasy role as musical accompanist, performing avatars’ actions that yield changes in the game world and contributing to the elements of immersion, agency, and transformation that narratologist Janet
H. Murray set forth in *Hamlet on the Holodeck: The Future of Narrative in Cyberspace* (1997). (Murray is quoted among game scholars with a frequency similar to Claudia Gorbman’s *Unheard Melodies: Narrative Film Music* among film music scholars.)

Collins points to *Frogger* (Konami, 1981) as “one of the first games to incorporate dynamic music,” (2008b, 19); by this term she seems to mean music that changes according to particular game actions initiated by the player. In *Frogger*, the object of which is to guide a frog avatar across a busy highway and then over a river, Collins counts “at least
eleven different gameplay songs” (2008b, 20), and she notes how the music will change abruptly at a point in the game when the player successfully maneuvers a frog into one of its five “safe houses.” Within a year, even closer connections between player movements and musical accompaniment would be programmed into *Dig Dug* (Namco, 1982), a game in which the music occurs only when the player keeps the avatar moving; bringing the avatar to a stop results in a cessation of the music, no matter where it is in the phrase (see Figures 12.8 and 12.9). A different melodic figure sounds to indicate that the end of a level is drawing near, after which point the main accompanying music returns but in double time, creating an effect of urgency reminiscent of the stock musical mood of the “hurry” in early film accompaniment, wherein tempo generates additional suspense. The completion of a level of *Dig Dug* triggers a cadential melodic phrase, always to be followed by the beginning of the main accompanying music at the start of the next level. The game has two other musical ideas that appear only for the introduction (see measures 2–4 of Figure 12.8) and conclusion of the entire game. Interestingly, the bassline for the music that accompanies the gameplay descends chromatically from a C to a G, and while the key signature of C major may not align the example too closely with a lament tetrachord like the famous one in Purcell’s “When I Am Laid in Earth” from *Dido and

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**FIGURE 12.8** The opening musical accompaniment of *Dig Dug* (transcribed).
Aeneas, the *Dig Dug* tetrachord nonetheless accompanies another narrative situation involving a descent into the ground.

The music in *Dig Dug* brings attention to a not uncommon situation where the logic of the gameplay takes precedence over the purely musical considerations: the jarring starts and stops anywhere within the musical phrase disrupt the melodic line even if the cause of the starting and stopping—a player making particular movement decisions in the game—may make sense from the ludological perspective. Live performers of music for early film were faced with similar situations when it came to matching the length of a film scene with the length of a musical cue. Ernő Rapée, in his 1925 *Encyclopedia of Music for Pictures*, describes these issues as problematic. When explaining how to use a march as an accompaniment for a newsreel, he states that “the procedure of coming to a satisfactory end of a march is a very important one” (Rapée 1925, 10). He also writes of the “trouble” with the “making of musical endings. The brutal procedure of breaking your music no matter where you are just because the cue for the next number is flashed on the screen is an antiquated procedure not in use any more in first-class theatres” (14).

A few years later, in the early sound-film era, the ability to synchronize music more closely quickly removed such discontinuities from film scoring. In video games, on the other hand, synchronization presents greater challenges due to the dynamic nature of the gameplay itself.

**Continuous Music**

One of the principal assumptions about music in silent cinema exhibition practice has been that it would have sounded continuously throughout a film; although later examples of film accompaniments from the 1910s and 1920s may indeed have featured constant musical underscoring, scholars such as Rick Altman have helped us to understand these examples as only one possibility for the way music was used in connection with
film presentations. Still, there were instances where music was heard from start to finish in early cinema, and that assumption lives on today. Comparing early video games with regard to whether or not the music was continuous provides another point of similarity with early film practice, for just as cinema sometimes found it useful to have wall-to-wall music, so too did some early video games, although the music in these early games may be rather primitive and even boring in its construction. *Pong* had continuous if arrhythmic tones, and the nature of these tones—one pitch signaling when the ball is hit, another for when it hits the wall, and a third one for when it is missed—is such that they are easily understood as having a function that supports the gameplay rather than having a musical function. In later games music can become an important game element for creating the effect of immersion discussed by Murray, but it seems not to carry that function in *Pong*. Rather, a player immersed in *Pong* may discern important information about the gameplay by noting which tone sounds, thus hearing whether the ball will be volleyed back or not, but the simple, irregular, and unpredictable alternation of tones makes for a musically unsatisfying experience. Not quite sound effects—a missed ball in the real world creates almost no sound at all, not the similar but higher-pitched tone found in the game—the musical tones here provide much more value as attempts at realism within the abstractions forced by the technological limitations than as musically compelling structures.

The boundary between sound effect and musical underscore becomes even trickier to assess in later games. Collins describes the tones used in the highly successful video game *Space Invaders* (Midway, 1978) as “nondiegetic,” writing that that the game “set an important precedent for continuous music, with a descending four-tone loop of marching alien feet that sped up as the game progressed” (Collins 2008b, 12). If the four-tone loop is heard as the “marching alien feet,” their representation of something from the world of the game’s story would enable the loop to be understood as a diegetic sound, but the short motivic loop is constructed in such a way that it functions at least equally well as a nondiegetic sound, four notes that form what can be seen as the most musically complete video game score up to its time. Collins, on the other hand, is rather quick to dismiss any games before 1980 as having anything of musical interest, writing that “by 1980, arcade manufacturers included dedicated sound chips known as *programmable sound generators*, or PSGs…into their circuit boards, and more tonal background music and elaborate sound effects developed” (Collins 2008b, 12; emphasis in original).

In *Space Invaders*, sounds built from white noise emanate when the player fires a missile as well as when the player’s missile hits an invader; synthesized tones happen when the UFO speeds across the top of the screen, and then another sound if the player successfully hits it (see Figures 12.10 and 12.11). Most important, however, is that four-note loop associated with the advancing invaders. The attackers can be shot and destroyed one at a time, but the game possesses a strikingly bleak procedural rhetoric, to borrow Ian Bogost’s phrase, which he defines as “the practice of authoring arguments through processes” (Bogost 2007, 28). Much of Bogost’s scholarship to date has dwelt on the ways that video games can make persuasive arguments about culture, economics, and politics. In *Space Invaders*, as with nearly all other games from this period, there is no way
to win the game on its own terms: here, the invaders will always eventually outshoot or overrun the human player. (*Missile Command* [Atari, 1980] featured another unwinnable scenario with a depressing procedural rhetoric, one where the player must attempt to shoot down nuclear warheads before they reach the cities, but the player will always lose to the computer’s ever-quickening rain of missiles; unless the player has achieved a high score, the game then concludes with a morbid taunt by flashing “The End” on the screen instead of the more familiar “Game Over.”)

As the player shoots missiles and the number of descending invaders decreases, their speed increases, something that was actually a feature resulting from the limitations of the early computer processor. The game’s programmer, Tomohiro Nishikado, noticed that the invaders could be drawn more quickly by the processor as fewer appeared on screen, and he decided to keep that as an element of gameplay:

Originally I wanted to move 55 Invaders at the same time, but the hardware only let me move one Invader every 1/60 second. As a result, Invaders began to move faster as they decreased in number. But in the end, this actually added more thrills to the game. (“Nishikado-san,” n.d.)

The accelerating advance of the invaders gets accompanied by a four-note descending melody that spans the interval of a perfect fourth and which gradually increases in speed, eventually becoming indistinguishable as a multinote melody. The increase in musical tempo as the level reaches its end marks another descendant of the “hurry”
trope from early cinema. This diatonic descending tetrachord, like the chromatic tetrachord appearing later in *Dig Dug*, falls within that long history of the descending fourth as an emblem of lament, a not inappropriate register to signal given the devastating failure that must accompany every playing of the game. Considering what the game’s music presents for us from the historical moment of the late 1970s, and a further way to understand this sound emerges. The game employs a four-note motive with fixed pitches, a fixed timbre, and fixed rhythms; all that changes is tempo, which goes through a simple procedure of gradually increasing. This loop thus belongs to the culture of repetition that Robert Fink describes in *Repeating Ourselves: American Minimal Music as Cultural Practice*; whether death-driven libido or capitalism-driven advertising, the strategy of the sound fits with composer Steve Reich’s concept of “Music as a Gradual Process” (1968).

Other games quickly began to imitate *Space Invaders*’ continuous yet repetitive music. A steadily pulsating rising half-step between E and F accompanies the action of shooting asteroids in *Asteroids* (Atari, 1979); again, as the number of targets dwindles, the pace of the loop (in this case, a two-pitch loop) increases (see Figure 12.12). Montfort and Bogost recount Sherry Turkle’s interview with a twelve-year-old *Asteroids* player who stated that the musical pulse of the game was “its heartbeat” (Montfort and Bogost 2009, 85–86). Another of the most popular games from that era, *Centipede* (Atari, 1980), also underscored its gameplay with a driving ostinato pulse, here, an even more heartbeat-like single pitch (B). As other insects appear on the screen—the player’s goal is to shoot as many as possible before being ultimately overrun—they are each accompanied by their own distinctive musical marker. When the spider appears and starts bouncing up and down, a rapid five-beat melody mickey-mouses the action with a contour that similarly moves up and down (see Figures 12.13 and 12.14), while the intermittent dropping of a flea down the screen brings with it another musical gesture that attempts to illustrate the visual action: a quick portamento from high to low.

**Figure 12.12** *Asteroids* (Atari, 1979).
Playing the Picture, Scoring the Game

The continuous ostinati found in these early games were soon accompanied by, or replaced with, more elaborate and often familiar melodies, such as 1980’s Carnival (Sega), which contains continuous music during gameplay (“Over the Waves,” also known as “The Loveliest Night of the Year,” sounds progressively higher and faster as the player fires a gun at various targets; see Figure 12.15). As we saw with 1977’s Circus, early game melodies not only were familiar, but they possessed narrative functions similar to those same melodies as they had been used in early cinema accompaniment. By the later part of the silent era, pianists, organists, and musical directors performing music during a film were usually expected to make the music support that film’s narrative. Essentially the same practices—that is, the ways the music was used to undergird a film—transferred to video games beginning in the late 1970s. We know that early accompaniments for film frequently turned to preexisting musical works ranging from works of concert-hall and chamber-music composers to popular songs of the nineteenth and early twentieth centuries. Similar repertoire sometimes appears in the soundtracks for early coin-op video games. It is important to keep in mind that for coin-op games in an arcade, music had to fill at least two important roles. Besides attempting to add to the immersive experience for the player, this music would also often have to compete with music from surrounding coin-op machines, and so the music also fulfilled a function as ballyhoo, inviting arcade visitors to play the game or watch as others played.
Advances in programmable sound chips in 1980 (Collins 2008b, 12) ushered in more elaborate music, at both the start of the game as well as throughout it. In his seminal study of the Kojak (1973–1978) theme, Philip Tagg ([1979] 2000) writes of the “reveille function” and “preparatory function” of title themes in relation to television music. The reveille function “attract(s) the attention of potential listeners to the fact that something (undefined) new is going to be presented” while the preparatory function “prepare(s) listeners or viewers emotionally with an affective musical description of the kind of general mood found in the subsequent presentation” (93). Music performing these two functions begins to appear in video games with some regularity in 1980, although an important pioneer in this regard would be Galaxian (Midway, 1979), a Space Invaders derivative that opens with a brisk fanfare whose blistering pace and chromaticism issue an attention-grabbing call to (virtual) arms, while preparing the player for the subsequent challenge of reflexes the game is about to offer. One of the most familiar of all arcade-game melodies first appeared in 1980: the bouncy two-voice arpeggiated passage that signals the start of every game of Pac-Man (Midway, 1980), announcing not only the beginning of something, but also a promise of something whimsical (see Figure 12.16). These brief musical introductions could sometimes become quite elaborate, as in the complicated three-voice nonimitative polyphony present in the opening to Galaga (Midway, 1981), a sequel to Galaxian (see Figure 12.17). In addition to the polyphony, Galaga displays surprising harmonic shifts: C to A♭, moving briefly to B♭, then settling, though still somewhat ambiguously, on the sonority of A–D–E, suggesting something of the unpredictability that one may expect from the gameplay.

Some introductory fanfares borrowed from existing pieces of music that by the early 1980s already carried decades of cultural associations from their use in screen media. Some of these borrowings have obvious connections to the story of the game about to begin, while others lack such cohesiveness. Scramble (Stern, 1981), one of the first sideways scrolling shooters, starts with a fanfare highly reminiscent of the famous cavalry charge in Rossini’s Guillaume Tell Overture, the part made famous by its use in film and television, in particular through its connection with the Lone Ranger radio
and television series (see Figures 12.18 and 12.19). The Scramble fanfare triggers associations with narratives of heroism, of charging in to the rescue; it is an obvious affective button to push at the start of this game. Music less connected to the game narrative could be found in something like the introductory music for the space shooter Gyruss (Konami, 1983), which breathed new life (along with a backbeat) into an electronic version of J. S. Bach's Toccata and Fugue in D Minor, a work that had appeared with some regularity in films, especially in horror films (see Figure 12.20). Stripped here of its accumulated cultural resonances with the gothic and the horrific, the Bach Toccata might seem to be a surprising eccentricity of early video game music, just an example of randomness, but again, a comparison with early film practices might help to explain its presence here.  

We know that early accompaniments for film frequently turned to preexisting musical works ranging from works of concert-hall and opera composers to popular songs of the nineteenth and early twentieth centuries. Similar repertoire sometimes appears in the soundtracks for early coin-op video games. In Phoenix (Amstar, 1980), another Space Invaders derivative, the game opens with a two-voice reduction of the anonymous Spanish guitar piece “Romance d’Amour,” a melancholic, minor mode work that does little, in accordance with Tagg’s preparatory function, to alert a player to the outer space battles about to begin (see Figures 12.21 and 12.22). Perhaps the music’s sad register foreshadows the player’s ultimate and inevitable loss in the game, but that the music was pre-existing and in the public domain provide an easier explanation. Still, it can be strangely troubling to discover that upon completing the final level in Phoenix, the player is rewarded with a bit of Beethoven’s Für Elise (see Figure 12.23); note that the barring of
this transcription follows the game’s pulseless version of *Für Elise* instead of its usual anacrusis.

The graphics limitations of the early video games encouraged a remarkably abstract and at times surreal array of narrative situations and characters (Donkey Kong [Nintendo, 1981], Pac-Man, Centipede [Atari, 1980], and Burger Time [Bally Midway, 1982] are but a few of the many that could fit this description). Such a rhetoric of randomness and imagination may serve as one explanation for why a game like Kangaroo (Sun Electronics, 1982) would contain snippets of Beethoven, Stephen Foster, and a nineteenth-century march, yet another and perhaps more probable reason may be
the extension of the tradition of early film accompaniment. In the first level of Kangaroo, a mother kangaroo gets separated from her baby kangaroo and must traverse up and through a simple maze while dodging apples hurled by monkeys (see Figure 12.24). The music introducing the level presents a part of Beethoven’s *Marcia alla turca* before turning to F. W. Meacham’s “American Patrol” March (1885) as continuous accompaniment for the level. As the kangaroo avatar jumps, climbs up a ladder, punches monkeys, and acquires fruit, corresponding musical gestures create several instances of mickey-mousing (for instance, climbing upwards triggers a rising melody). Ringing a bell hanging in the maze causes the Westminster Chimes to sound forth (another early film accompanying possibility: using a piano to simulate bell sounds). When the mother
kangaroo successfully rescues her baby, a fast snippet of Stephen Foster’s “Oh! Susanna” emerges to mark the victory. Such blending of concert hall (Beethoven) and popular (Foster and Meacham) was common in early film accompaniment, and the connection to the early twentieth century becomes even stronger when considering that the music I have labeled here as “popular”—the Foster and Meacham pieces—would most likely not have been what a typical young person in a 1982 video game arcade would have thought of as “popular.”

A composite score like the one accompanying Kangaroo derives in part from the tradition of Carl Stalling’s cartoon music, which Daniel Goldmark has traced back to Stalling’s early training as a cinema musician in the early years of the twentieth century. Stalling’s pastiche scores for Warner Bros. cartoons are famous for their rapacious use of existing songs and concert-hall and operatic music, and because of Stalling’s background as a cinema pianist and conductor he was a primary conduit for bringing those earlier traditions into mass media of the mid-twentieth century. By the early 1980s, it was common to find video-game music quoting liberally from a similar range of popular and concert-hall and operatic works. Frogger occasionally sounds a melodic phrase from “Camptown Races” (see Figure 12.25), whose unsung words—“Goin’ to run all night / Goin’ to run all day”—are surprisingly apt for this game about a frog trying to dart through a crowded highway and over a treacherously crowded river. Besides Kangaroo, Stephen Foster’s music shows up again in Tapper (Bally Midway, 1983). Crazy Climber (Taito, 1980) opens with a bit of Henry Mancini’s “Baby Elephant Walk” before later presenting some of Pachelbel’s Canon in D, Scott Joplin’s The Entertainer, and Mancini’s theme from The Pink Panther. Gameplay in Pengo (Sega, 1982) is accompanied by Gershon Kingsley’s synthpop instrumental “Popcorn,” while the cinematic scenes between every other level employ the “Ode to Joy” from Beethoven’s Ninth Symphony (see Figure 12.26). Crystal Castles (Atari, 1983) takes a more Russian turn, turning to Tchaikovsky (“Marche” from the “Danses Caractéristiques” from the Nutcracker Suite, and the march melody from the third movement of his Sixth Symphony; plus a quick eight-note motive of chromatically ascending perfect fourths that originates

**Figure 12.23** Für Elise as reward for completing the final level of Phoenix (transcribed).
in Moussorgsky’s “The Hut on Chicken Legs” from *Pictures at an Exhibition* (see Figure 12.27). Bits of Rimsky-Korsakov’s “Flight of the Bumblebee” underscore a level with a beehive in *Donkey Kong 3* (Nintendo, 1983).

Rick Altman has drawn attention to early film composer J. S. Zamecnik’s functionally clever habit of constructing his various photoplay cues—his generalized situational and mood pieces, like “Funeral March,” “Plaintive Music,” or “Death Scene”—in related keys. While such a practice made it easier for a film accompanist to shift from scene to scene, this kind of tonal coherence also allowed the music to unify the film in subtle but important ways. Similar practices begin to appear in video game music in the early 1980s.
*Pac-Man* contained only two musical cues: the opening fanfare and the music accompanying the intermissions that occurred after every few levels. Spectral analysis of samples from the original arcade soundtrack reveal that the pitches fall squarely between C and C♯ major, just as the intermission falls in between F major and F♯ major; for consistency here I am notating both in the lower keys. The intermission establishes F major as its key (compare Figures 12.16 and 12.28). The opening section occurs only once in a game, but the intermissions could happen as often as a player continued to advance through the levels. Still, the amount of time between levels and the repetition of the same intermission music each time work against the establishment of a compelling key relationship.

More elaborate tonal design exists in the sequel to *Pac-Man*, *Ms. Pac-Man* (Midway, 1981). Like its original, *Ms. Pac-Man* features introductory music, this time with a greater sense of independence between the two voices (see Figure 12.29), and again, intermissions break up gameplay every few levels. But here, the intermissions take on a more overtly cinematic quality by featuring the icon of a clapperboard (declaring it to be “Act I”) with the words “They Meet” before illustrating how Pac-Man and Ms. Pac-Man

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**Figure 12.27** *Crystal Castles* (Atari, 1983).

**Figure 12.28** The intermission music from *Pac-Man* (transcribed).
collided into each other while avoiding their respective monsters (see Figure 12.31). The music for Act I moves from the F major of the opening theme to a more ominous F minor (see Figure 12.30). This is a simple musical maneuver for signaling a sinister turn in the story but one that makes more sense when situating it against the framework of the early silent-film world that the intermission evokes. The second intermission, or

![Figure 12.29](image1)

**Figure 12.29** The introductory music for *Ms. Pac-Man* (Midway, 1981) (transcribed).

![Figure 12.30](image2)

**Figure 12.30** Act I music from *Ms. Pac-Man* (transcribed).

![Figure 12.31](image3)

**Figure 12.31** Act I from *Ms. Pac-Man*. 
Act II, presents Pac-Man and Ms. Pac-Man chasing each other across the screen with increasing speed, and here the music assumes the character of a ragtime piano piece whose syncopations and momentary chromaticisms evoke Scott Joplin’s mature style (see Figure 12.32).

The music in Donkey Kong also contains stylistic allusions to early twentieth-century ragtime and Tin Pan Alley gestures; furthermore, the various musical cues are constructed in a way that they establish a tonal center (B♭ major) that provides an important unifying function to the game and its narrative. Besides containing several important innovations in game design and introducing Mario, who would become a franchise character for their company, Donkey Kong also stands apart from its fellow arcade video games for the relative complexity of its musical accompaniment. The game centered on a carpenter (who would later be identified as a plumber) with a large nose and bushy moustache, a character all the more remarkable for its lack of any special abilities: Mario could run, jump, climb, and occasionally wield a hammer, but without any superhuman powers. The efforts at story-telling were groundbreaking for the time. The game uses introductory and interlevel animated sequences to reveal a story where a giant ape has taken a woman (Mario’s girlfriend) up a ladder and then jumps with such force that it causes the girders to bend. Accompanying the opening sequence is, in parallel fifths, the melodic phrase from the Dragnet (1951–1959) television series that Jon Burlingame describes as “the decisive and melodramatic four-note phrase [that] became a kind of American musical code for ‘you’re in trouble now’” (1996, 15) (see Figures 12.33 and 12.34). Although the Dragnet phrase has not yet surfaced in any of the early
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 twentieth-century photoplay books, its diminished harmonic structure and exaggerated character nonetheless tie it to that musical world. (Wizard of Wor [Midway, 1980] had earlier used this Dragnet melody to good effect, opening each level with the first four notes of the phrase and withholding the final chord until a successful completion of a level; see Figures 12.35 and 12.36.)

Each level of Donkey Kong begins with an identical cue that playfully establishes B♭ major as the home key (Figures 12.37 and 12.38). The first level has a constant syncopated bassline (Figure 12.39) that spells out a B♭ triad, while each time Mario successfully jumps over one of the barrels thrown at him by the ape, it is accompanied by a rapid five-note melody (Figure 12.40) that momentarily introduces an E♭ chord into the mix.
FIGURE 12.36  *Wizard of Wor.*

FIGURE 12.37  Level introduction music from *Donkey Kong* (transcribed).

FIGURE 12.38  Level introduction from *Donkey Kong*.

FIGURE 12.39  First level ostinato bass line from *Donkey Kong* (transcribed).

FIGURE 12.40  Melody accompanying a successful jump over a barrel in *Donkey Kong* (transcribed).
That melody’s rapidly rising and falling contour matches Mario’s physical movements as he rapidly jumps up and down over a barrel. Each of Mario’s deaths unleashes a torrent of chromatically related sixths and fifths before delivering a return to the stability of the B♭ major tonic (Figure 12.41). If the player has remaining lives, the death music is then followed by the level introductory music (see again Figure 12.37). Completing each level brings a musical reward, although each respite from the ape’s assaults linger for only a moment. Successfully completing the first ramp level elicits a short, happy moment in the music before three ominous low F♯s sound, which accompany the ape again stealing Mario’s girlfriend and causing the heart above them to break, only then to be followed again by the introductory level music (of Figure 12.37) (see Figures 12.42 and 12.43). Three of Donkey Kong’s four levels have continuous musical accompaniments; the basslines of the rivet level (Figure 12.44) and the conveyor belt level (Figure 12.45) also support the B♭ tonality. Defeating the rivet level on the first stage, which causes the ape to fall, allowing Mario and his girlfriend a brief moment together, triggers another ragtime-flavored cue that ends with a B♭ seventh chord. With the start of the next level, B♭ major returns as the primary tonality. The entire game then uses a single key area to unify the various levels and actions, using the brief disruption of the chromatic death music as contrast and to add momentum back into the home key.

Besides having no precedent in any video game soundtrack, this remarkable tonal coherence operates in interesting ways next to game theorist Jesper Juul’s categories of incomplete versus incoherent story worlds. Incomplete worlds leave out
information about the fiction; Juul gives as an example the way that the Super Mario Brothers games tell us the names of the brothers Mario and Luigi but do not name their parents. Incoherent worlds present inexplicable contradictions, such as in a game like *Donkey Kong*, where Mario’s girlfriend finds herself repeatedly kidnapped, no matter what else happens in the game; even if a player, as Mario, successfully saves the girlfriend in levels 1 and 2, by level 3, she has been kidnapped again and apparently returned to the original hideout. To further flesh out the idea of incoherent worlds, Juul asks the question, “Why does Mario have three lives?” Mario’s ability to die and then be reborn three times (in most settings of the game), or to earn an extra “life” after achieving a certain number of points, are two more examples of incoherence in the world of *Donkey Kong*. Juul proposes “that we call this type of fictional world an *incoherent world*, meaning that there are many events in the fictional world that we cannot explain without discussing the game rules” (2005, 130). Apart from the opening C minor cue—perhaps a musical example of incoherence following Juul’s categories for story worlds—the *Donkey Kong* underscore actually creates a powerful thread unifying the game from start to finish, thereby defying its narrative incoherence. The contradiction of tonal coherence and narrative incoherence points to the need for further work bridging the fields of video game and music scholarship.

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**Figure 12.43** Completion of level one in *Donkey Kong*.

**Figure 12.44** Rivet level ostinato bass line from *Donkey Kong* (transcribed).

**Figure 12.45** Conveyor belt level ostinato bass line from *Donkey Kong* (transcribed).
Th e early phase of video-game history discussed in this chapter reveals several examples where the incorporation of music mirrors several of the characteristic functions of early film music, even sometimes borrowing the harmonic and melodic vocabularies of the music associated with that era. The technology behind the sounds made important advances between 1977 and 1983, allowing for a relatively quick shift from monophony to homophony to polyphony, rapidly ushering video games from a medieval era to one in comparison more floridly renaissance in style. By 1983, some game scores began to take advantage of the multiple voices now available; the platform game *Mappy* (Namco, 1983) has a musical underscore that employs four-voice nonimitative polyphony (see Figure 12.46). But the ability to program more than one line of melody at once is only one element tied in with the way music works in video games; at least as important are the increasingly sophisticated ways that the music and the game action begin to interact. After the crash of 1983, video-game arcades began to decline as they faced competition from increasingly advanced home units as well as the suddenly unfolding market for personal computers. Collins posits 1984 as the important moment in video game music when “looping . . . began to gain real prominence” (2008b, 19), and although the simple ostinati of soundtracks like those of *Space Invaders* and even *Donkey Kong* appear before 1984, her point stands because of the much greater ability of video games to offer music that can react in dynamic ways with the player’s actions in the games. The emphasis on repetition found within the early video-game scores remains, but with far greater possibilities for variation. Scholars studying music and media interactions have only begun to scratch the surface of this rich new field of video games and the cultural resonances of their musical strategies.

**Notes**

1. I am grateful for the crucial feedback and help of Rick Altman, Daniel Goldmark, Michael Pisani, Mauro Botelho, Dan Boye, Bill Lawing, Jim Buhler, Kevin Donnelly, and Thomas Lodato.
6. See Montfort and Bogost 2009, especially pages 19–30, for a helpful explanation of how the Atari VCS worked.
7. See Montfort 2003.
8. See Altman 1996.
10. See Williams 1997.
13. William Gibbons discusses later video game uses of Bach’s Toccata and Fugue in D Minor, along with other works, in Gibbons 2009.
15. See Goldmark 2005, 12–16.
17. See chapter 4 of Juul 2005.

**Bibliography**


