

ENCYCLOPAEDIA FOR POPULAR MUSIC OF THE WORLD ENTRY “Video Games Audio”

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Video games audio encompasses dialogue, ambience, sound effects and music. Each of these elements has varying degrees of interactivity. Although contemporary games contain some linear music, adaptive and interactive audio (also referred to as ‘dynamic audio’) is what distinguishes game sound from most other forms of media. Although the terms are often used interchangeably, “adaptive” audio is generally referred to as sound that reacts to transformations in the gameplay environment—such as a change from day to night set by a game’s timer mechanism, or the increasing tempo of the marching feet in *Space Invaders* (Bally-Midway 1978). Adaptive audio is not directly triggered by a player, unlike “interactive” audio, in which sound events occur dynamically in direct reaction to a player’s movements. The player triggers the event cue, and can repeatedly activate it, such as by making a character jump up and down. Diegetic sound in games also has both non-interactive and interactive components. In non-interactive diegetic audio, the sound event occurs in the character’s space, but the character does not directly interact with it, unlike interactive diegetic sound, with which the player’s character can interact. Finally, a level of more direct audio interaction is that of physical interaction in which the player (often, as well as the character), bodily interacts with the sound on screen through pressing buttons, dancing on a footpad, playing a drum, etc.

Sound in games serves many of the same functions as sound in linear media (film, television, etc.), though the added degree of interactivity in games can mean that turning off the sound, or failure to pay attention to the sonic cues, can lead to loss of points or even to a character’s demise. Symbols and leitmotifs are often used to assist the player in identifying other characters, moods, environments and objects, to help the game become more comprehensible and decrease the learning curve in a new game. A key role of sound in games is the preparatory function that it serves—to ready the player for an upcoming event—such as a sound to mark the approach of an enemy, requiring the advanced drawing of a weapon.

Atari’s *Pong* (1972), an electronic table tennis game, was the first video game to feature sound, making the beeping “pong” sound when the ball hit the paddle, but on-going sound in games did not begin until *Space Invaders*. Sound in games was fairly slow to develop in contrast with other elements of gameplay. Personal computers in the early 1980s were considered business machines, and audio was not seen to have many business applications, and was therefore not a priority for computer developers. Even on consoles designed for games, there was little room in games for music due to the memory restrictions. At best, a title song or short victory tune may have been used. Most 8-bit computers and games consoles had single subtractive synthesis programmable sound generator chips, usually with three tone channels and one noise channel. These chips offered little control over the timbre of a sound, usually limiting sounds to single waveforms without much ability to manipulate that waveform. More advanced chips were manufactured by a few companies, like Commodore 64’s SID chip, in which each of the three tone channels could select from a range of waveforms, and various effects such as ring modulation and an envelope generator enabled the SID to more accurately imitate other instruments than previous chips.

Add-on third-party frequency modulation (FM) synthesis soundcards began to develop in the mid 1980s when manufacturers recognized that game players and musicians wanted improved sound quality from their PCs. FM soundchips also found their way into many of the arcade games of the 1980s, as well as a few games consoles, such as the Sega Megadrive (known as the Genesis in North America). Compared to programmable sound generators, these chips were more flexible, offering a wider range of timbres and sounds, without significantly taxing the memory capabilities of the systems, although FM was quickly surpassed by wavetable synthesis (Super NES).

Late 1980s and early 1990s games were commonly composed using MIDI, a format that leant itself well to the interactive components of game audio. Some game production companies developed software to take advantage of the dynamic capabilities of MIDI code. LucasArts’s Interactive Music Streaming Engine software (iMUSE) (1991), for instance, composed music dynamically to interact with game events. Although by the early 1990s most computers had FM sound cards supporting MIDI, many of these sound cards were economically designed, and the FM synthesis left MIDI music sounding disappointing to many game players. With the arrival of CD-ROMs in the late 1980s, MIDI was predominantly temporarily abandoned, and with it many aspects of interactivity offered by the format, as CD audio was viewed as better suited to more linear sound design. The CD-ROM technology ensured that there was more room for music in games, and—perhaps more importantly to the games composers—since the audio was not reliant on a soundcard’s synthesis, there were not significant differences between how a piece would sound on different systems.

Recent games consoles such as the Microsoft X-Box 360 and the Playstation 3 have expanded to DVD-Rom technology, three-dimensional audio in 7.1 surround, with up to 512 channels of sound, and combine both wave/mp3 files with MIDI formats to allow for increasing interactivity in the soundtracks. Many popular music artists and films composers are becoming involved in producing material for video games soundtracks, and sales of games soundtracks are beginning to increase, with *NBA Live 2003* (2002 Electronic Arts) the first to achieve platinum status. Soundtracks of underscore music are usually only released in Japan, but Western orchestras have recently begun to perform video games music to sold-out shows, and an increasing number of soundtracks are being released, indicating a growing market for the music.