

Music and Sound in Nintendo's Metroid

Introduction

When I was a kid, I owned and played a Nintendo Entertainment System (NES), like many other kids in Finland in early 1990's. One of the games I remember quite fondly was *Metroid* (Nintendo 1986). *Metroid* has received many sequels and it is, with Super Mario and *Zelda*, among Nintendo's most well-known and popular game series. *Metroid* is often mentioned as having an unique, eerie and at times disturbing atmosphere. I believe that the game's soundtrack is largely responsible for this.

In this essay I will discuss *Metroid*'s soundtrack in light of some theories and concepts of audiovisual research. First I will give an overview of the NES sound hardware, and then proceed to describe the game and its soundtrack. Besides the music, the sound effects are also discussed.

The NES sound hardware

A brief introduction to NES sound chip is needed before discussing the *Metroid* music. The sound chip, along with other features of the NES console, is quite primitive in today's perspective. The polyphony was limited, as well as timbral possibilities. NES

has five sound channels: two pulse-wave channels, one triangle wave, noise, and a PCM channel. The frequency, loudness and envelope of the pulse wave channels can be controlled efficiently. There are also four different settings for pulsewidth for producing some timbral variety.

On the triangle channel pitch can be controlled, but the loudness is constant. Because of limitations in the sound hardware the triangle channel's sound is not smooth, but somewhat harsh and distorted, especially in low register, as certain non-harmonic parts of the spectrum are emphasized.

The noise channel can produce different timbres of noise with an amplitude control. The PCM channel can be used to play low-quality digitized audio. In Metroid, however, it is not used.

Typically in NES games, the pulse channels are used for melody and accompaniment, triangle channel for bass, and noise as percussion. For sound effects, the same channels are used, and for the time of the effect, the needed channel is dropped out of the music to produce the needed sound.

The game

Metroid can be described as an action-adventure-platform game. The playfield is seen from the side, and player controls the game's hero, intergalactic, cybernetically enhanced bounty hunter, Samus Aran. The quest of the game is to eliminate strange, dangerous lifeforms, metroids, and space pirates led by an entity called Mother Brain. Metroids and the pirates hide in the caves of planet Zebes.

Zebes has five areas: Brinstar, where the game begins, Norfair, lava-filled area with many secret passages, hideouts of two mini-bosses, Kraid and Ridley, and finally Tourian, area where the metroids and Mother Brain reside, and which can be only

entered after Kraid and Ridley are eliminated. All areas are connected to Brinstar, except Ridley's hideout, which is connected to Norfair. Each area has a different color palette and different graphics and enemies. The gameplay is similar in all areas, but some areas are more challenging than others.

Metroid's soundtrack was composed by Hirokazu Tanaka. He has stated in an interview that he was dissatisfied with the 'pop-like, lilting tunes' that were common in the game music of the time, and felt that the music often didn't fit into the game's atmosphere (Brandon 2002). He wanted to create a soundtrack for Metroid in which there is no clear boundary between sound effects and music, and where the clearly melodic music is saved only for the ending (ibid.).

The soundtrack in general

While game audio has a lot of common with audio in other audiovisual media such as film, there are certain differences (Collins 2008: 128). Games and their soundtracks do not necessarily unfold in a linear, narrative manner, but what happens in the game and what is heard can depend on the actions of the player. Situations in the game can take varying time, and music cannot be synchronized to game events like in movies (ibid.). Music in games is often looped and repeats as long as the game situation lasts. This is also how most music in Metroid works.

Collins has developed a typology of audio in games based on these ideas. The fundamental distinction is made between *non-dynamic* and *dynamic* audio. Non-dynamic audio functions like audio in linear media, and it is typical in game situations where player does not actively participate, such as introductory movies. Dynamic audio, on the other hand is heard during interactive situations in the game, and it reacts to events happening in the game or actions of the player. Collins calls the former *adaptive*, and the latter *interactive*. (Collins 2008: 125–127).

One basic distinction used in discussions of film audio, and also with game audio, is between diegetic and non-diegetic audio; the audio which is part of the fictional world versus audio which is outside of it (ibid.). It is often noted that the relationship between audio and the fictitious world of the visual media is in many cases more complicated, and cannot be reduced to this simple dichotomy (see. e.g. Chion 1994: 73–79). This, I believe, is also the case with Metroid.

In Metroid, there are nine musical cues, of which two are non-dynamic, and seven dynamic. The non-dynamic cues are heard in the introductory screen and during the game's ending.

Each game area in Metroid has its own definitive musical cue. These can be considered interactive in the sense that player can quite freely enter and exit different areas, and spend as much time in them as he/she likes. Tourian, however, is more complex case. It is quite straightforward area and has three cues, changing dynamically depending on the player's position: one cue is heard after the area is entered, and during the passageway in which player encounters the metroids, second cue is heard in the Mother Brain's chamber, and third after Mother Brain has been defeated, while the player must escape within a time limit before time bomb sets off.

In addition to the area themes, there is a cue which is heard in corridors where player can get special items such as new weapons, and in elevator rooms leading to other areas. I will call this the *special area music*.

I believe that the musical themes of Brinstar, Norfair and Kraid's hideout are the three most prominent in the game. They are also longer and musically most complex of the dynamic cues. Ridley's hideout's music is heard somewhat less, and it is also musically simpler. Tourian is special case, as it is the final area of the game, and the music functions a bit differently, as will be discussed later.

Non-dynamic music: title and ending

The title music, which begins immediately after the game loads has two parts. The beginning has high echoed short notes against longer notes in very low register. This forms a perfect sonic match with the image, with desolate surface of a planet at the bottom, and blinking stars above. Soon, however, the title text appears into this picture, and it alternates with a longer text in smaller font giving some background to the game's plot.



Image 1. Title Screen

The second part of the theme paints more hopeful picture with its repeated chord sequence, which is varied and developed towards a climax that never comes. Instead, we are lead to the low menacing tone again, and the song starts over.

The ending music, obviously the least often heard cue in the game, resembles most the "traditional" melodic NES music. It has an important function of being a reward for the player for completing the game, providing catharsis for the player (Brandon 2002), and it also accompanies the significant moment when it is revealed that Samus is actually a woman, as she removes her helmet and suit.

Brinstar, Norfair and Kraid's hideout

Brinstar is the area where the game begins and where most other areas are connected. Its theme (see example 1a) has a bright, rhythmically well defined upbeat character, and it uses mainly consonant intervals and major tonality. It creates a positive, encouraging feeling, which is important especially when the player returns to Brinstar from more dangerous areas, and also because in the beginning the player must be encouraged to learn to play the game.

The two larger areas connected to Brinstar, Norfair and Kraid's hideout, have much darker mood in their music, and the areas are also much harder. The two themes also form an interesting pair, as their musical features are, in many aspects, exact opposites of each other.



Image 2a. Brinstar



2b. Norfair

A musical score for the beginning of the Brinstar cue. The score is written for three instruments: Pulse 1, Pulse 2, and Triangle. The time signature is common time (C). The key signature is one flat (B-flat). The score consists of four measures. Pulse 1 starts with a whole note G4, followed by a half note G4, and then a quarter note G4. Pulse 2 starts with a quarter note G2, followed by a quarter note A2, a quarter note B2, and a quarter note C3. Triangle starts with a quarter note G2, followed by a quarter note A2, a quarter note B2, and a quarter note C3. The score ends with a double bar line and repeat signs.

Example 1a. Beginning of the Brinstar cue. (All transcriptions are made by the author.)



1b. Beginning of the Norfair cue.



1c. Beginning of the Kraid's hideout cue. The second pulse oscillator echoes the first.

Norfair is a lava-filled world with many secret passages. The color palette emphasizes red and purple colors, and the music has a harsh, dissonant nature. The pulse oscillators play mostly parallel intervals, major thirds and fourths at relatively low register, and triangle channel provides a bass line which in the beginning forms a sharp dissonance of semitone with the lower pulse oscillator (see ex. 1b), and later emphasizes the interval of fourth.

Kraid's hideout's music (ex. 1c), on the other hand, has only two voices, as the second pulse wave oscillator is used as an echo to the first with a delay of a quaver and at lower volume. The music is also harmonically simpler. The pulsewidth of the pulse oscillators is set to 50 %, which produces a hollow-sounding overtone series which has only odd partials, in contrast to narrower setting used in Brinstar and Norfair's music, for example. Graphically Kraid's hideout emphasizes white and blue colors, and gameplay-wise it is quite straight-forward. The music, along with the color scheme creates a feeling of cold loneliness, contrary to the saturated warmth of Norfair.

The music in these cases works together with other aspects of the game to create a certain mood. Michel Chion (1994: 5) argues that sound in audiovisual setting has an *added value*; the sound makes us perceive certain qualities in the image, even though we might not notice that the sound is the cause for these qualities. This is an important point, and applies to game music as well as sound effects.

Nicholas Cook (1998) makes also many relevant points in his discussion of musical multimedia. Although his model for the multimedia may be too rigid in itself to be used with games, his discussion of the metaphoric basis for the model, also based on certain cognitive theories of sound-image relationships (ibid.:66–97) is quite interesting. He notes that the different component media in multimedia create a new meaning, like two concepts which are brought together in a metaphor. In this case, the 'attributes of the two media intersect', and certain properties of music, for example, are associated with the other component media (ibid.:69). In order for the metaphor to work, the components must also have a certain enabling similarity (ibid.:70). The music in *Metroid*, I believe, can be understood in this way: the overall mood cannot be said to come from a single source, but instead, the game situation, color scheme, musical material and timbral attributes all work together in creating it.

Dangerous and special situations

In certain game areas the music is used to convey the feeling of immediate danger. In these situations many interesting things happen. Not only the music turns more chromatic, disoriented and structurally simpler, but there is also a clear shift away from the nondiegetic nature of the musical cues described above.

Zach Whalen (2004) has argued that music in games often reflects the game state, situated in the distinction between *safety* and *danger*. In this light, the *Brinstar* theme is most clearly in the safe side, *Norfair* and *Kraid's hideout* themes being somewhat less

safe, but still providing mainly support for the general game mood, not feeling of immediate threat. Musical cues which can be clearly situated in the "danger" category are the three cues of Tourian, first of which is also used in the battles with the minibosses. Ridley's hideout is also more clearly on the dangerous side than the three main area cues. It has similar color palette than Norfair, to which it is connected, but contrast is created by music which is more straightforward and threatening, but I think, still clearly non-diegetic.

The special area theme is an ambiguous case, and I would say it is quite neutral in its safe/danger-status. It is not threatening, but breaks the continuous mood provided by the area musical cues. It consists of ominous line of high, chromatic notes of the pulse wave oscillators against a repeating series of rapid short low notes of the triangle wave oscillator. The special area theme is also difficult to situate in the diegetic/non-diegetic axis. The cue, at least to me, gives a feeling of presence of something unexplained. It sounds a bit like noises made by an alien machinery or computers, which is appropriate interpretation, as the cue is heard near elevators and places where special items can be acquired, and the graphics that represent the game area there also resemble technological constructs or cultural artefacts, like the statues which hold the items.

The image shows a musical score for two channels: 'Pulse 1+2' and 'Triangle'. The score is written in 4/4 time. The 'Pulse 1+2' channel is in the treble clef and features a series of high, chromatic notes. The 'Triangle' channel is in the bass clef and features a repeating series of rapid, short, low notes. The score is divided into two systems. The first system shows the 'Pulse 1+2' channel with notes on the staff, and the 'Triangle' channel with a sequence of notes. The second system shows the 'Pulse 1+2' channel with notes on the staff, and the 'Triangle' channel with a sequence of notes. The score is marked with '8va' at the top and bottom, indicating an octave shift. The 'Pulse 1+2' channel has a '5' and a '10' above it, and the 'Triangle' channel has a '10' above it. The score ends with a double bar line and repeat dots.

Example 2: The special area cue. Here the second pulse channel also echoes the first.

One more concept which is useful in discussing Metroid's music, is Chion's definition of *acousmatic* sound in context of audiovisual situation (Chion 1994: 71–72). By acousmatic sound he means sound whose source is not seen (ibid.). He also notes how acousmatic sounds in film often make us want to look into the direction where the sound is coming (ibid.:). In games, we can often, of course, actually go there, not only hope that the camera moves there (Collins 2008: 130). The special area cue, when heard, gives an immediate feeling that something interesting is here, even when it is not yet seen, but the special item can be found in a room in the end of the corridor the player has just entered.

The musical cue heard upon entering into Tourian, the final game area, is immediately threatening and disturbing. One pulse wave oscillator plays a panicky, nervous figure while other plays disoriented, chromatic longer notes underneath. The triangle oscillator plays a series of short notes, this time rising in pitch. In Tourian the player first encounters the strange, medusa-like lifeforms whom which the game got it's name. The chaotic music contributes to the effect of terror upon seeing the creatures for the first time. While the rising triangle sounds do follow their own rhythm, and do not collide with the appearance of the metroids, I think it is still possible to imagine this as the sound of the metroids, heard acousmatically when they are not seen.



Image 3. Tourian and a metroid

In Mother Brain's chamber, the triangle wave plays continuous sound reminiscent of some kind of organic bubbling, and the pulse oscillators play more concentrated repetitious figures, which actually are alternations between two pitches. Musical

substance is reduced here to a bare minimum, and this cue can be, almost without question, situated into the game world, as part of diegesis.

After Mother Brain is defeated, the player must escape within a time limit, by climbing up a corridor with some challenging jumps. There, the music turns clearly non-diegetic, and also more hopeful and heroic, but still providing sense of excitement over this last ordeal before the victory.

Sound effects

In *Metroid*, sound effects function to make the game world more believable, and to emphasize movement and game actions, in order to guide the player. Sounds in the former category are closer to being diegetic, while sounds belonging to the latter category are often non-diegetic and in certain cases actual musical cues.

Whalen (2004) discusses many aspects of sound effect use in *Super Mario Bros*, a classic game for NES as well, and many points he makes are also relevant for *Metroid*. However, there are certain differences. He points out, for example, how the upward glissando sound heard when Mario jumps emphasizes 'the physicality of Mario and his kinesthetic involvement with his environment' (Whalen 2004; see also Chion 1994: 120–122). While Samus' jump is accompanied by *mickey-moused* glissando sound as well, it is much shorter than in Mario, producing a less pronounced effect. Also, Samus' footsteps make audible sound. There is a clear inclination to make the world of *Metroid* more serious, compared to Mario's cartoonish fairy-tale world.

There are two short musical cues that function as a sound effect. The first is heard in the beginning of the game, when Samus gradually appears into the starting position in Brinstar. The other cue (example 2) is heard when Samus gains a useful item such as a new weapon or an energy tank. This cue is quite remarkable in that it stops the game for the time it sounds, and acts as a kind of punctuation. It is also heard in subsequent *Metroid* games, providing continuity in the series.



Example 3. The item cue

One prominent sound that needs to be mentioned is the sound made by the doors in the game. These doors open by shooting, and as they open, they make an upward glissando sound on the triangle oscillator. This sound effect, heard quite often during gameplay, contributes to the overall feeling of the game, forming a kind of organic unity. The organic unity, which is also mentioned by Tanaka (Brandon 2002), is achieved specifically by creative use of the triangle oscillator sound in music and sound effects.

Conclusion

I have examined the soundtrack of the classic NES game Metroid. I believe that the main reasons for the effectiveness of Metroid's soundtrack in supporting the mood of the game are 1) using appropriate musical material to emphasize the mood, especially with non-tonal and non-melodic material. 2) blurring the line between diegetic and non-diegetic sound especially in dangerous game situations, as well as with sound effects, and 3) effective use of the possibilities of the NES sound hardware to support the the intended mood together with the musical material, graphics, and gameplay aspects.

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