

Music, Sound, and Video Games

Handheld and Mobile Games—Issues and Considerations

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Handheld and Mobile Games—Issues and Considerations

Karen Collins

a constant battle of technological constraint against aesthetic choice; it has echoed the development of home game consoles and arcades in its progress and approach to these constraints; and it illustrates an ongoing desire for consumers to be able to play games anywhere, anytime.

Of particular importance is that there are several distinctions between console and handheld gaming that have impacted the way that handheld games—and their sound—have developed.

1. The portability of handhelds has meant that these games are often played in a public space, and thus designers are conscious of the fact that sound may become intrusive, rather than an aid to gameplay. However, this does not mean that sound does not play an important role. In fact, the development of headphones designed for handheld gaming, as well as rhythm-action and sound- or music-based games for handhelds indicates that these devices are by no means meant to be played silently. Rather, the consideration has to be made at the design stage what role sound will play, and how to give an alternative to sound in the event that it is switched off.
2. A second major distinction is, of course, the processing and memory capabilities of portable devices.
3. Likewise, the fact that these games are often played in public spaces means that there is an expectation that the player may be interrupted, or just play for a short time (e.g., on the bus on the way to school or work, waiting in line at an event, and so on). As such, **casual games** have risen to the forefront of the handheld market. A consequence of the casual nature of the games and lower price-point of handheld games has meant that audio has in many cases been developed by non-professional sound designers and composers, as the games are often developed by an individual or very small team. Many of the largest mobile phone developers, for instance, still have no in-house sound designers or composers. Rather, sound is either contracted out at best, or assigned to a team member whose primary function is not sound-related.

Early Electronic Games



Mattel's LED-based Auto Race,⁶ which came out in 1976, was the first all-electronic handheld videogame. Using a simple variation of a calculator chip, it had just 512 bytes of memory.

Programmed by Mark Lesser, he noted in an interview, "The sound was implemented using a single output and a piezo-ceramic speaker—one output line to generate sounds and music, such as it was, without any sound driver hardware. The toggling of the speaker had to occur within the program loop, with variable timing to produce tones" (Stilphen n.d.).

What this means was that the speaker itself was a simple tone generator.



Mattel's *Football* game of 1978 that was probably Mattel's most popular seller. Sound was nearly always used as a selling point. A description in the 1978 Mattel Toy Fair Catalogue advertised, "Cut back, avoid tacklers, run for daylight! Score and hear the Victory Sound!" (83). *Football II*, released the following year, boasted "Simulated game sounds include whistle and the victory tune for those hard-fought touchdowns and field goals" (Mattel Toy Fair Catalogue 1979:95). A simple monophonic melody of six notes was about all the game's processor could handle for its theme song.

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- The Nintendo Game Boy was a significant advance in handheld game sound, having a dedicated polyphonic sound chip.
- Also, although the sound chip was similar to that of the Nintendo Entertainment System home console, the Game Boy had a very distinct sound, which is perhaps one of the reasons why it has been so popular with chiptune musicians.
- The chip had three 4-bit semi-analog tone channels and one noise channel pseudo-stereo programmable sound generator.
- The first channels were square waves, which were commonly used for chords or melody. There were four duty cycle options for the square waves, which set the timbre of the wave sound (12.5%, 25%, 50%, and 75%). The first channel had volume and frequency sweep, while the second was limited to volume control, which meant the first channel was more commonly used for melodies (Gevaryahu 2004).
- Channel three was a variable wave channel with 32 4-bit programmable samples, and was commonly used for bass-lines.
- Channel four was a white noise generator, most often used for percussion sounds.
- A simple 4-bit digital to analogue converter with high pass and low pass filter options output the sound to the amplifier. With Game Boy, therefore, polyphonic music could be created, and for the first time complete songs were heard during game play, such as in Tetris. Sound effects were still synthesized sounds, mostly from the white noise generator, however, and so Game Boy helped to create its own aesthetic, one which is still popular with chip-tune composers today.



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- What in the world were we thinking when we designed the sound hardware? The original design goals were that the circuits
 1. Be cheap
 2. Require relatively little CPU to make useful game noises
 3. Have sufficient range and accuracy for tolerable music
 4. Have four channels
 5. Have direct access to the DACs (digital to audio converters)
 6. Be cheap (Domin and Schick 1987)



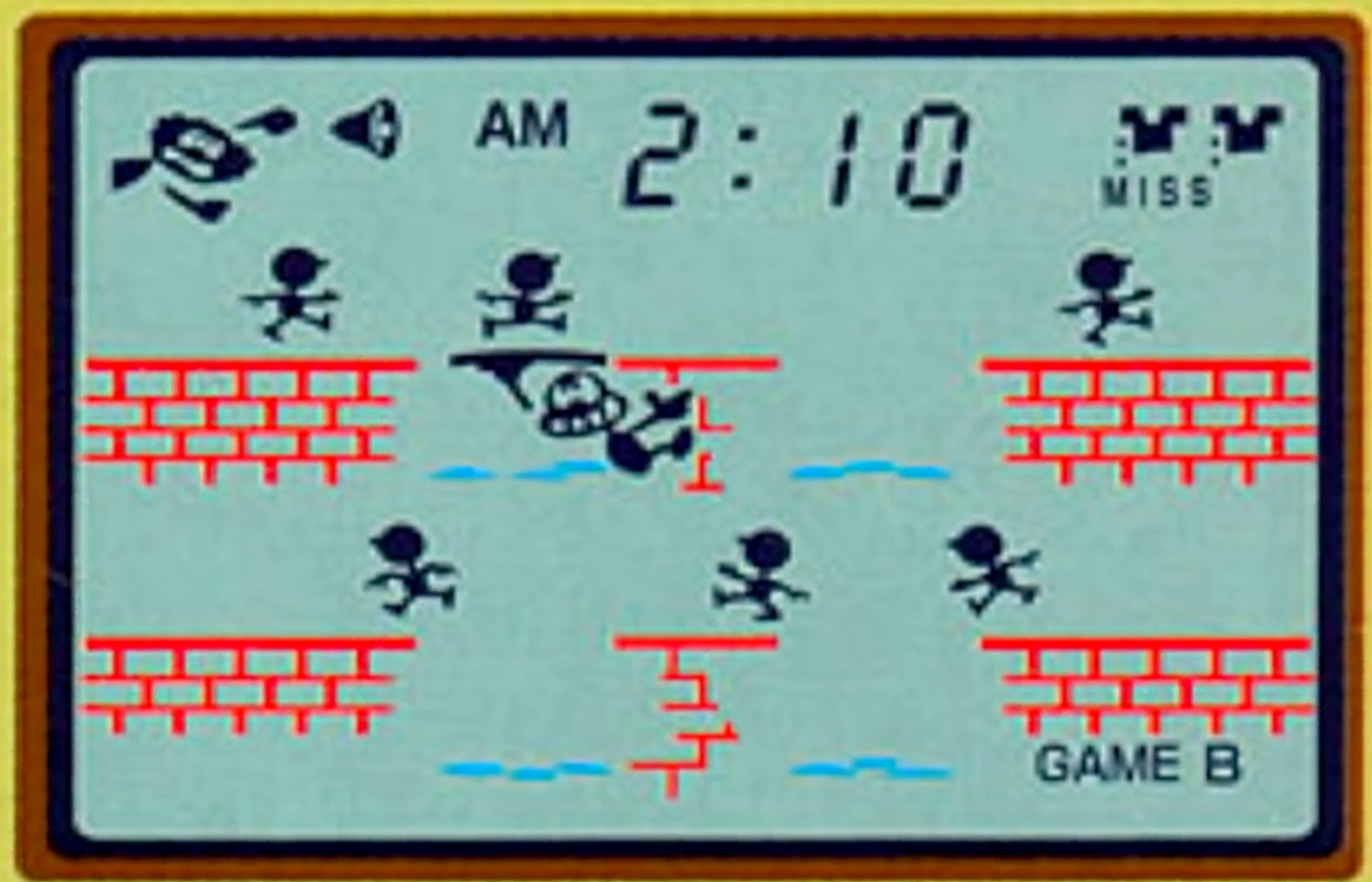
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- The history of mobile phone games (distinguished from handheld gaming in that games are not the primary intended use of the machines) in many ways echoes the history of consoles and handhelds.
- The earliest mobile phone game, Snake, written by Taneli Armanto on the Nokia 6110 in 1997, was black and white and lacked sound. The phone also featured basic Memory and Logic games.
- Network issues?!
- Some similar issues with audio capacities lagging behind graphics
- As ringtone composer Peter Drescher elaborated a few years ago, “The most important trick is to be as ruth- lessly efficient as possible. You want to squeeze every last drop of variation out of each and every byte of audio data at your disposal. Repetition is the enemy, compression is your ally, and creative use of limited resources is your battle cry” (2006). A developer at Glu Mobile elaborates: “The challenge with mobile games is that we have sound size limitations . . . While we don’t use voice actors, we do use music a lot. We have to think about what will take up the majority of space. We have to think about the visuals and the sound—what will create the richer experience” (Hetherington 2008). A constant balance is struck, therefore, between what is needed and what can be technically accomplished.



MA



ACL

ALARM

GAME A

GAME B

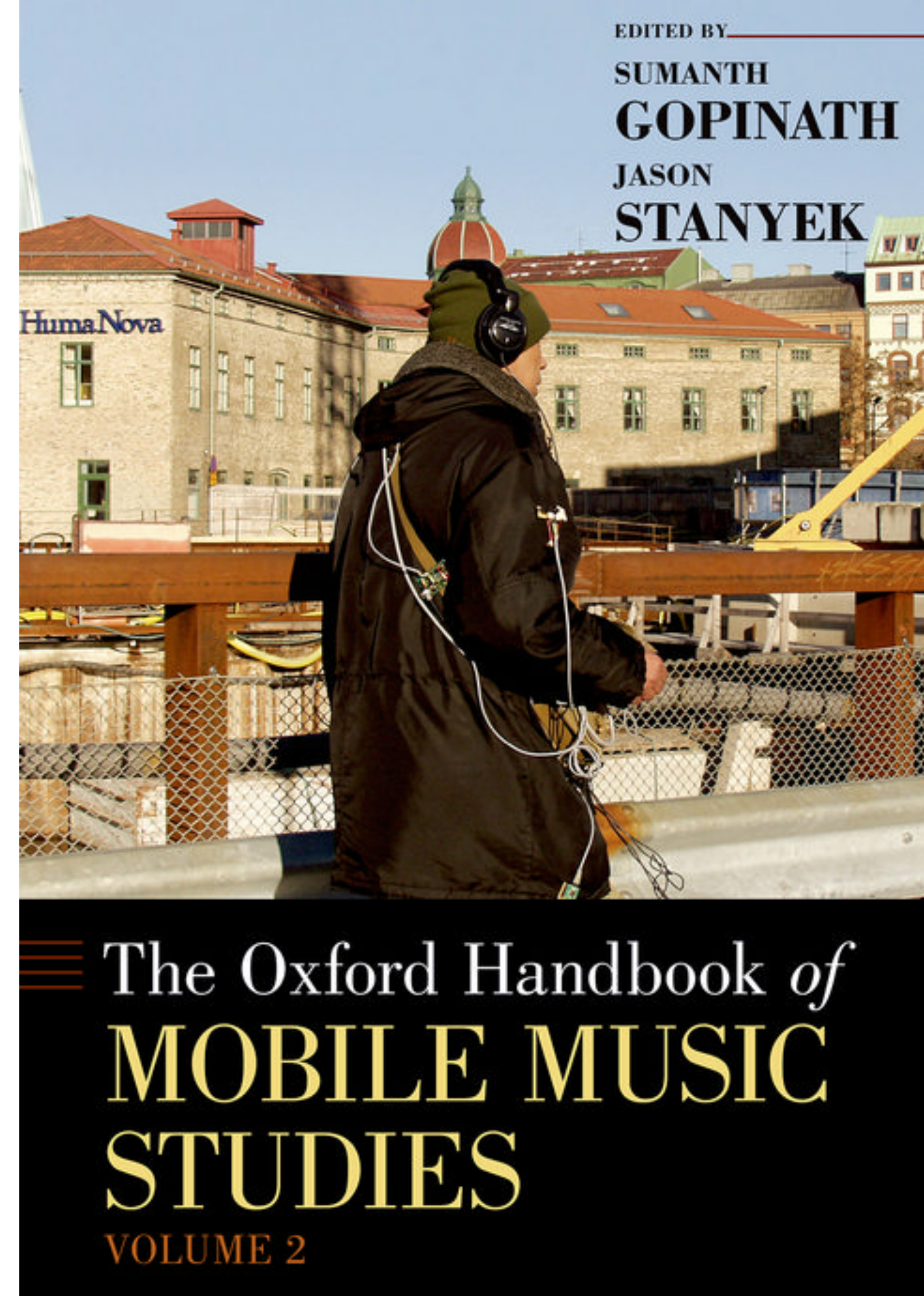
TIME

©1981

Wayne Marshall, “Treble Culture”

By the end of 2010s:

- massive *possibility* for high-fidelity recording (and increasing access to it)
- more “bass culture” present across the globe than ever (think of reggae producers, rumble of the bass moving into hip hop and kindred EDM genres)
- but the irony that more people than ever are listening to music primarily through small plastic speakers, often via cellphones, laptop computers, leaky earbuds
- does this “treble culture” recall the days of transistor radios or even gramophones and scratchy 78s?
- preference for convenience, portability, and publicity
- the experience of other people’s music and noise in public space—assessments often politicize (and racialize and assign gender and sexuality to) particular sounds and sonic practices



Thinking about our Group Project Informance/Event

Some beginning logistics

- This group project is one of your major projects in this class (and ties in to the final project as well).
- I do intend that this be a group project—it'll be less intimidating and also help us create an event that doesn't last for four hours (!). We do have some significant time constraints here.
- What are we doing? My intention is that we perform video game music selections or do other creative works related to video games (could also be a new arrangement or new composition), or could be a short presentation
- When is this going to be? I'm sending an email survey with some options later today (we'll find the time that works the best for the majority of people)
- What do I want you to do? Talk to another person or two or more who you think you'd like to work with, and start brainstorming some things that seem attractive to you as potential ideas.