Female Credit: Excavating Recognition for the Capcom Sound Team

Andrew Lemon and Hillegonda C. Rietveld

 Draft – May 2020,

Abstract

The chapter is based on a collaborative project that focuses on the mostly female Capcom Sound Team. The Japanese game development company Capcom (CAPsule COMputers), is known for some of the most popular action arcade games of the 80s and early 90s, developed with mainly male players in mind. The composition and sound design work by this collective of female composers influenced a host of game composers through their pioneering work on early arcade hardware. Yet in versions of games ported from the arcade to home consoles and computers, their work was left uncredited. Popular recognition for their composition and sound design work has been relatively slow, due to a number of factors that include the use of pseudonyms and the company's team-focused crediting policy, as well as the routine ex-scription of women in a male-dominated game culture where, as Kocurek puts it, young competitive "technomasculinity" is foregrounded.

Originality: Within the currently developing study of game music, a focused discussion of issues in sexuality and gender has only relatively recently commenced, for example in terms of game play, game music culture, and composition. With our research, we wish to contribute new insights to this area of knowledge, which has not yet addressed gender relations within the game industry in the area of sound and music.

Rigour: To understand how the original composers for Capcom's arcade games were credited, in comparison to the producers responsible for porting their musical compositions for home play, we focus on three examples: *Commando* (1985), *Bionic Commando* (1987) and *Ghouls 'n Ghosts* (1988). These were first created for Capcom's 1980s arcade game library and then ported for home computers, the Commodore 64, Nintendo NES and ZX Spectrum. Resonating with Nooney's archeological approach to gender politics in video game history, our proposed presentation is based on an excavation of game archives and game versions in order to evidence how the composers of Capcom's successful arcade game titles found themselves in a position of invisibility, which is quite persistent and only sporadically corrected and updated. As Collins explains, an archaeological approach to game sound can achieve an understanding that circumvents, and can be critical of, dominant historical discourse. The capture of data for this chapter was performed by carefully checking for the credit information, including research of online game credit databases such as the VGMDb.net, which provides an archive of Game Soundtrack Album credits; MobyGames.com, a site dedicated to video game credits; and The Cutting Room Floor, a site dedicated to preserving information on material that is present inside the game data, but not normally accessible or used in game play. In order to review and check the data obtained, extensive use was also made of longplay video content (full gameplay videos).

Significance: We conclude not only that game industry histories need revisions that take into account hidden and marginalised identities of video game creators, but also that there is an urgent need to improve the protection of creators in the game industry, perhaps even a need for standardisation of crediting practices, comparable to the film industry. This is especially pertinent for remixed or arranged in-game music which carries over into the game releases themselves.

This chapter focuses on the Japanese game development company Capcom (CAPsule COMputers), arguably "a well-established developer and publisher,"[1] known for some of the most popular action arcade games of the 80s and early 90s, including *Ghosts 'n' Goblins* (1985), *Commando* (1985), *Bionic Commando* (1987), *Final Fight* (1989), *Ghouls 'n' Ghosts* (1988), and *Street Fighter II* (1991), developed with male players in mind. The music for these action games was provided by the mostly female Capcom Sound Team. Ayako Mori and Tamayo Kawamoto joined Capcom in 1984, and other core members of the team included Junko Tamiya, Manami Matsumae, Harumi Fujita, Yoko Shimomura and Tamayo Kawamoto, most of whom who left the company in 1990 shortly after their seminal soundtrack work as a team on the arcade game *Final Fight*. Yoko Shimomura, who composed the memorable themes for *Street Fighter II*, left Capcom for the game developer Square in 1993 to pursue her dream of scoring orchestral music for role-playing game (RPG) titles, bringing to an end the domination of Capcom's female sound team. This collective of female composers went on to influence a host of game composers through their pioneering work on early arcade hardware. Yet in versions of games ported from the arcade to home consoles and computers, their work was left uncredited. Popular recognition for their work has been relatively slow, due to a number of factors that include the use of pseudonyms and the company's crediting policy, as well as the routine exscription of women in a male-dominated game industry.

Versions of the original compositions were created for various game publishers when these arcade games were ported for home play. In such cases, the versioning practices by composers, such as the UK-based Rob Hubbard and Tim Follin, were usually credited, sometimes for the music, other times for the sound of the game, while the composers of the original music stems are not named. Even retrospective developer interview material at Capcom's own website makes no mention of the composition and music work for its popular games.[2] Capcom had a policy in place from the early 80s to only identify creators via non-gender-specific pseudonyms in its titles, which were sometimes rotated amongst members of staff who may have had up to eight different handles under which they produced content for the company.[3] In this context, it was near impossible to identify the composers and, due to the way in which surnames are not differentiated,[4] neither could their gender be inferred. This may be partly because "the commercial, functional nature of this work sets it free from the stranglehold of auteurism."[5] Game composers work to briefs, in a similar manner to visual designers, rather than create work in order to stand out as individual artists. For example, when discussing her move to game publisher Square, after her time at Capcom, Yoko Shimomura comments that, "(g)etting my name out there had never been a major goal of

[1] Mia Consalvo, *Atari to Zelda : Japan's Videogames in Global Contexts* (Cambridge, MA: MIT Press, 2016), 170.
[2] Anonymous, "Final Fight Developer Interview," *Capcom.com* (8 February 2019), https://game.capcom.com/cfn/sfv/column/list/cat4768. Accessed 28 April 2020.
[3] Alexander Brandon and Chris Greening, "Junko Tamiya Interview: Creating Capcom's Incredible NES Scores," *VGMOnline*, trans. Mohammed Taher (19 May 2014), http://www.vgmonline.net/junkotamiyainterview/; Chris Greening, "Harumi Fujita Interview: Ghosts, Goblins, and Gargoyles," *VGMOnline*, trans. Alex Aniel (5 December 2015)*, http://www.vgmonline.net/harumifujitainterview/. Both accessed 28 April 2020.
[4] Richard Moss, "How Bad Crediting Hurts the Game Industry and Muddles History," *Gamasutra* (6 November 2018), https://www.gamasutra.com/view/news/329003/How_bad_crediting_hurts_the_game_industry_and_muddles_history.php. Accessed 28 April 2020.
[5] Daniel Martin-McCormick, "Various Artists. Diggin' in the Carts: A Collection of Pioneering Japanese Video Game Music," *Pitchfork* (16 December 2017), https://pitchfork.com/reviews/albums/various-artists-diggin-in-the-carts-a-collection-of-pioneering-japanese-video-game-music/. Accessed 28 April 2020

mine, but now here I was in a situation where I found I had to attach my name to my music where if I didn't, I didn't belong there."[6] Crediting practices are a perennial issue in the industry, eventually leading the International Game Designer Association (IGDA) to develop its Credit Standards Committee as far back as 2003, stating in 2014 that,

> Employees are often mislabeled, unlabeled, or left off the credits. In fact, a 2006 IGDA Game Writers Special Interest Group survey revealed that 35% of respondents (48 out of 134) either "don't ever" or "only sometimes" receive official credit for their efforts … we believe that employers effectively and accurately assigning credits are crucial.[7]

Nevertheless, the Crediting Standards Guide is a guide, and is therefore not necessarily enforceable,[8] as game cultures and concomitant legal frameworks differ across the world.

During the late 1980s and early 90s, when Capcom's Sound Team laid the musical ground rules for subsequent action games, Capcom's policy on crediting also seemed to differ from non-Japanese crediting practices. In particular, in the US and UK, composers who provide music and sound effects for video games tended to work as individuals,[9] whether as freelancers joining single projects or as solo artists working in-house at game developing companies.[10] By contrast, Japanese video game companies took a team-based approach to audio for arcade games, and their musicians also performed on music albums and during live concerts of the video game soundtracks. For example, between 1988–97, Capcom had an in-house band, Alfh Lyra wa Lyra, which included some members of the Capcom Sound Team.[11] Capcom's band was resurrected for the 2002's re-release of the *Capcom Game Music Series* (SCITRON DISCS).[12] The credits on recent album releases of video game material provide more detail than the games, acknowledging the original composers, as well as the arrangers who follow up by porting and/or remixing the original source material. Examples of such soundtrack albums include *Bionic Commando* in 2008,[13] and the 2014 reboot.[14] The availability of online databases cataloging both game credits (MobyGames) and soundtrack album releases (VGMDb) also aids the project of identifying and crediting these musicians.[15] Further recognition for the team of composers is therefore improving, as illustrated by two documentaries, *Digging the Carts* on Japanese video game composers,[16] and *Beep: A Documentary History of Game Sound*,[17] which includes an extensive set of

[6] Nick Dwyer, *Digging in the Carts [Radio]*. Series 2 / Episode 6. Red Bull Radio (6 December 2017), https://soundcloud.com/digginthecarts/diggin-in-the-carts-series-2-episode-6-06122017-december-06-2017-ca-2h at 38:00.
[7] IGDA, *Game Crediting Guide 9.2* (NP: International Game Developers' Association, 2014) https://igda.org/resources-archive/crediting-standards-guide-ver-9-2-en-jp-2014/.
[8] Anonymous [Editorial], "Giving Credit Where Credit Is Due," *Gamasutra* (3 October, 2008), https://www.gamasutra.com/view/feature/132202/giving_credit_where_credit_is_due.php. Accessed 28 April 2020.
[9] Andreas Wallström, "Rob Hubbard Interview," *C64.com* (nd). http://www.c64.com/interviews/hubbard.html. Accessed 28 April 2020.
[10] Frank Cifaldi, "Catching up with Tim Follin," *Gamasutra* (26 December 2009), https://www.gamasutra.com/view/news/97596/Playing_CatchUp_Tim_Follin.php. Accessed 28 April 2020.
[11] Alfh Lyra wa Lyra aka Alph Lyra was comprised of the following members of Capcom's Sound Team at the time: Isao Abe, Yasuaki Fujita, Tamayo Kawamoto, Manami Matsumae, Shun Nishigaki and Yoko Shimomura.
[12] Alfh Lyra wa Lyra, *Capcom Game Music VOL 2* [CD] (Tokyo, Japan: SCITRON DISCS, 2002); Alfh Lyra wa Lyra, *Capcom Game Music VOL 3* [CD] (Tokyo, Japan: SCITRON DISCS, 2002).
[13] Simon Viklund, *Bionic Commando Rearmed (The Soundtrack)* [CD] (New York: Sumthing Else Music Works, 2009).
[14] Simon Viklund, *Bionic Commando Rearmed 2 Original Soundtrack* [CD] (New York: Sumthing Else Music Works, 2014).
[15] "Bionic Commando: Rearmed (The Soundtrack)," VGMdb [Video Game Music Database] (28 May 2008, last edited 7 June 2018), https://vgmdb.net/album/8726. Accessed 28 April 2020.
[16] Nick Dwyer and Tu Neill (dir.), *Digging the Carts* (Red Bull Academy, 2014), https://daily.redbullmusicacademy.com/2014/10/diggin-in-the-carts-series. Accessed 28 April 2020.
[17] Karen Collins, *Beep: A Documentary History of Game Sound* (Canada: Ehtonal, 2016).

interviews with video game composers and sound designers. Interviews with individual game composers have also been valuable sources of information, such as those published by VideoGameMusic Online (VGMO) between 2015–17.

Despite a changing game industry, improvements in acknowledgment, a widening demographic of players and developers (including initiatives such as Women in Games), and even a well-received guide to video game composition by the successful game composer Winifred Phillips,[18] female game composers have more often than not been *exscripted* from game histories. For the discussion here, the question remains why this female team of Capcom's composers were not given due credit at the height of their works' popularity in the arcades, as well as when their work was ported for game play at home. Although the video game industry may be thought of monument valley of men, where bygone assumptions of male dominance and power are "being built again into new structures,"[19] the perception persists of a male-dominated industry where, as Carly A. Kocurek puts it, young competitive "technomasculinity" is foregrounded:

> The common assumption that gaming is and rightly should be for boys and men even (when) in the empirical evidence that women make up a large percentage of gamers is neither natural nor logical. It is the product of a long-standing historical and cultural construction of video gaming among video gamers begun during the golden era of the video game arcade. [20]

Such masculinist narrative is partly sustained through the manner in which (in Laine Nooney's words) "our sense that videogame history is 'all about the boys' is the consequence of a certain mode of historical writing, preservation, memory, and temporally specific affective attachments, all of which produce the way we tell the history of videogames."[21] Also, the currently developing study of game music, a focused discussion of issues in sexuality and gender has only relatively recently commenced, for example in terms of game play,[22] game music culture,[23] and composition.[24] With the discussion that follows, we wish to contribute to this area of knowledge. Resonating with Nooney's archeological approach to gender politics in video game history, the discussion that follows here is based on an excavation of game archives and game versions in order to evidence how the composers of Capcom's successful arcade game titles found themselves in a position of invisibility, which is quite persistent and only sporadically corrected and updated. In the context of her archaeological approach to game sound, Collins explains that this "allows us to not only revisit current media objects and texts within a new framework, but also allow us to revisit

[18] Winifred Phillips, *A Composer's Guide to Game Music* (Cambridge, MA: The MIT Press, 2014).

[19] Shira Chess, *Ready Player Two: Women Gamers and Designed Identity* (Minneapolis: University of Minnesota Press, 2017), 173, 177.

[20] Carly A. Kocurek, *Coin-Operated Americans: Rebooting Boyhood at the Video Game Arcade* (Minneapolis: University of Minnesota Press, 2015), 191.

[21] Laine Nooney, "A Pedestal, A Table, A Love Letter: Archaeologies of Gender in Videogame History," *Game Studies* 13, no. 2 (2013). http://gamestudies.org/1302/articles/nooney

[22] Melanie Fritsch, "Beat it!–Playing the 'King of Pop' in Video Games," in *Music Video Games: Performance, Politics and Play*, ed. Michael Austin (New York: Bloomsbury, 2016), 153–176.

[23] Rob Gallagher, ""All the Other Players Want to Look at My Pad": Grime, Gaming, and Digital Identity," *GAME: Italian Journal of Game Studies*, 6, no. 1 (2017).

[24] David Machin and Theo van Leeuwen "Sound, Music and Gender in Mobile Games," *Gender and Language* 10, no. 3 (2016): 412–432; Michael Austin, "Orchestrating Difference: Representing Gender in Video Game Music," in *Masculinity at Play*, ed. Nicholas Taylor and Gerald Voorhees (London: Palgrave-Macmillan, 2018), 165–183; Hillegonda C. Rietveld and Andrew Lemon, "The Street Fighter Lady: Invisibility and Gender in Game Composition," *ToDiGRA: Transactions of the Digital Games Research Association* 5, no. 1 (2019), 107–133.

the histories and chronicles of our media" 25 in order to achieve an understanding that circumvents, and can be critical of, dominant historical discourse.

To understand how the original composers for Capcom's arcade games were credited in comparison to the producers responsible for porting their musical compositions for home play, we focus first on three examples: *Commando* (1985), *Bionic Commando* (1987) and *Ghouls 'n Ghosts* (1988). These were all first created for Capcom's 1980s arcade game library and then ported for home computers, the Commodore 64, Nintendo NES and ZX Spectrum. Taking an archival approach, the capture of data for this chapter was performed by carefully checking for the credit information being retrieved through hands-on gameplay of the three selected titles on their various platforms either via hardware, including: the Commodore 64, the Nintendo Entertainment System / Nintendo Famicom.26 Where the hardware was unavailable, the crediting information was checked through emulation, in addition to an investigation into the ROM program data for each of the arcade games in question. Additional archival research was conducted in the historical digital databases of *Digital Magazine* and *Digital Fanzine* via emulated Commodore 64 disk images; these were retrieved and checked using the VICE Commodore 64 emulator (Version 3.4; Viceteam, 2019). Additionally, *Game Magazine* articles were accessed via archives of print media preserved digitally at the Internet Archive (Archive.org). In order to review and check the data obtained, extensive use was also made of longplay video content (full gameplay videos) present on both archive.org and YouTube.com as well as more traditional sources of information. These include online game credit databases such as the VGMDb.net, which provides an archive of Game Soundtrack Album credits; MobyGames.com, a site dedicated to video game credits; and The Cutting Room Floor, a site dedicated to preserving information on material that is present inside the game data, but not normally accessible or used in game play.

According to game historian John Szczepaniak, "[y]ou cannot even begin to imagine the Herculean task of disentangling Japanese credit listings… And once you find a thread and follow it down the rabbit hole, you just bring up more questions than answers."27 Here, we did exactly that, and jumped into the proverbial rabbit hole. As Capcom was not always transparent in providing credits for the individual contributions by its team members, assessing credit for the work performed by members of the Capcom Sound Team in the 80s and early 90s is, indeed, challenging. For example, *Video Game Music Online*'s interviews with composers Junko Tamiya28 and Harumi Fujita29 show that it was Capcom's policy at the time to only credit via pseudonym, which were often rotated to refer to the same person. For example, Junko Tamiya had several pseudonyms, including Gon, Gonzou and Gondamin. In addition to this layer of obfuscation, memory storage limitations in early arcade games often resulted in an absence of a staff roll or a post-game credit sequence. In this context, it is a challenge for researchers (particularly video game music database administrators) to seek out proper credit information for titles, with many relying on decoding high score tables default values,30 and hidden data inside game code,31 as well as interview sources to establish who

25 Karen Collins, "Game Sound in the Mechanical Arcades: An Audio Archaeology," *Game Studies* 16, no. 1 (2016).
26 The Nintendo Famicom is the original Japanese version of the Nintendo Entertainment System (NES).
27 Moss, "Bad Crediting."
28 Brandon and Greening, "Junko Tamiya Interview."
29 Greening, "Harumi Fujita Interview."
30 Adding credit information (in heavily abbreviated form) was a common practice at the time as the highscore table was a possible place to insert default values which would display at boot up of the arcade machine – these would be written over by players during gameplay until the machine was switched off, and then would revert to the default values.

had contributed music to the game. This policy was also motivated by an attempt to prevent the poaching of staff by competitor companies, especially during the fledgling years of arcade development in Japan.32 In seeking out the actual credits for composition work, our research identified regular staff changes at Capcom during its early years, with staff who began their game music careers at Capcom moving on to perform work for other titans of the arcade industry including Namco, Taito, SNK and even home console. Notably Yoko Shimomura went on to work at Square after her time at Capcom. Ultimately, this tactic did not really help with retaining staff in the long term.

In home computer ports of arcade game software, there is also a lack of credit or attribution for composition work due to size optimisation requirements that often negate full ending credits and attributions of the original work converted by the porting team. In addition, the composition credits for many of the home console and micro-computer versions of original game music have routinely been attributed wrongly to the (albeit impressive) reversioning porting team. Coupled with the very different attitude of solo practitioners in the West, in contrast to a more team-based approach of Japanese developers to crediting all of the aforementioned has led to many of the original works by these female composers being inextricably linked to the covers and arrangements produced by those responsible for home conversions of these classic arcade games. In doing so the credit for the music composition for those titles seems to have been misattributed, if not in the raw data then certainly in the public consciousness. This is further complicated by the porting arranger at times gaining inspiration from Capcom's own console conversion process. Observing this is certainly not a slight on the game musicians who arranged these conversions and whose work is highly regarded, especially within the technical limitations of the hardware they were working with, and we also recognize that the original game composers were influenced by other popular music sources in their work. Here, though, we wish to note the game composers who produced the original compositions and, in particular, the melodies that many of the home ports are based on.

Within the context of archival opaqueness, we first discuss three examples of crediting practices during home computer conversions of Capcom original arcade game material, *Commando* (1985), *Bionic Commando* (1987) and Ghouls 'n Ghosts (1988). In the process, we review how crediting was handled in-game, starting with the home conversions of these arcade titles in chronological order. *Commando* is a 1985 top down arcade shooter game title produced by Capcom and features a non-stop barrage of wargame thrills where the protagonist pursues and rescues prisoners of war while defeating enemy combatants in a one-man army setting. The game's music score was written by Capcom sound team member Tamayo Kawamoto, drawing influences from war film soundtracks. For example, her pecussive solo reminds of the main theme of Frank de Vol's score for *The Dirty Dozen* (1967) referring to its 95 bpm (beat per minute) martial percussion solo in her own composition albeit at a much faster tempo, around three times that of the original.33 Another point of reference can be found in Jay Chattaway's Main Theme score for *Missing in Action* (1984);34 a helicopter sound effect that is very similar to the film's opening sound design can be heard over Kawamoto's Commando theme music when opening the arcade game. The original arcade machine did not credit Kawamoto, lacking both a full credit roll and any

---

31 Adding abbreviated credit information into padded areas of ROM storage was also common at the time, which would only be accessible by reading the chips out as this data was superfluous to the game. John Aycock and Patrick Finn, "Uncivil Engineering: A Textual Divide in Game Studies," *Game Studies* 19, no. 3 (2019).
32 Moss, "Bad Crediting."
33 See Frank De Vol, 'Main Title From "The Dirty Dozen"', on *The Dirty Dozen (Music From The Original Sound Track)* [Vinyl]. Hollywood, CA: MGM Records, 1967.
34 See Jay Chattaway, 'Main Theme' for *Missing in Action* (Dir. Joseph Zito, 1984)

hidden material in the high score table, instead merely listing other Capcom arcade games from previous years.

The driving groove of Rob Hubbard, for the ported Commodore 64 home play version, feels funkier than Tamayo Kawamoto's original soundtrack. Covering the original composition quite closely, it takes inspiration from the "insert coin" sound effect that Kawamoto had initially created for the arcade game.[35] Hubbard claims he created the new version in one night:

> I went down to their [Elite Systems] office and started working on it late at night, and worked on it through the night. I took one listen to the original arcade version and started working on the c64 version. I think they wanted some resemblance to the arcade version, but I just did what I wanted to do. By the time everyone arrived at 8.00am in the morning, I had loaded the main tune on every C64 in the building! I got my cheque and was on a train home by 10.00 am.[36]

On loading the ported Commodore 64 game, a simple text screen of credits appears. The screen makes no mention of the original producers of material for the arcade game and solely credits Rob Hubbard for "Sound", the line denoting the copyright marking "©" to Japan Capsule Computers UK. It may well be that the lack of a reference to the original composer of material is chip-memory and screen-space related. According to Chris Butler, programmer of the Commodore 64 version of *Commando*, the porting company Elite Systems[37] required its team to store the entire game in memory to avoid loading extra material from tape for the title,[38] which led to the home conversion being cut back quite a bit from the arcade original. The lack of information about the developer and production team adds to the game's enigmatic mystery, yet it also opens a space for assumptions that in a masculinist game industry, which *exscripted* not only the original game music composer, but also her gender.

Bionic Commando was released by Capcom in 1987 for the arcade platform featuring a novel bionic-arm-swinging mechanic and an archetypal lone protagonist railing against a seemingly far stronger enemy, an army on the side of an authoritarian regime. The title features a distinctive, varied and, for its time, experimental soundtrack by Harumi Fujita. A mix of music genres ranges from the merengue and bossa nova to a stereotypical military-styled marching style of theme music that adds a layer of humour. Fujita explains that she is particularly proud of her tone generation (instrument design) in this soundtrack, with the composer making very good use of the games FM based sound chip in creating a varied, rich set of instrument tones and percussion for the titles score.[39] Musician Tim Follin handled the conversion work for the software developer Software Creations and publisher US Gold (under their Go! label) to be played on home computers such as the ZX Spectrum and Commodore 64 in European territories in 1988. The result is an original set of complex interpretations of Fujita's original themes, style and tonal structure. In the case of Fujita's Level 1 "Forest theme" for the arcade release, Follin uses the original material as a starting point, but once forty-five seconds into the music, the interpretation significantly veers away from this, building on the original music material to create something new through extensive use of arpeggiation and extreme ring modulation effects, to float back to the original

35 See Insert Coin SFX from Commando (1985, Capcom, Arcade), recorded here: "01 - Credit - Commando (Arcade) - Soundtrack - Arcade," video, 0:02, 10 May 2016, posted by VintaGamers Paradise https://youtu.be/j4WT8jAVwgg.
36 'Waz' and 'Kenz', "Interviews with Rob Hubbard," *The SID Homepage* (c.1997), http://www.sidmusic.org/sid/rhubbard.html. Accessed 28 April 2020.
37 Gary Penn, "The Butler Did It!," *ZZap64* 17 (September 1986), 104–105.
38 The music file was 6 kilobytes in size, which in the early days of game development was substantial compared to the total memory size of 64 kilobytes available on the Commodore 64.
39 Greening, "Harumi Fujita Interview."

composition in a looping manner. Elsewhere in the conversion, the composition is nevertheless built, with added flair, directly on Fujita's recognisable original compositions. In *Lethal News*, a Commodore 64 disk-based scene magazine, Tim Follin famously comments that, "it started like an arcade conversion! ... I started converting the title tune, and it just developed, slipped out of my grip and became something, that was very different from what I had in mind, at the beginning. Quite messy!"[40] As for *Commando*, Harumi Fujita is not credited as the original composer. The in-game credits are sparse, offering a small opening screen on the version for the Commodore 64 that merely gives credit to the conversion team, partly in response to screen space and memory size constraints on the home computer versions of the game. The ending screen, in particular, is even more minimal, simply showing a congratulatory message to the victorious player.

Bionic Commando was remade in 2009 as *Bionic Commando: Rearmed*[41] by Capcom on home console and computer platforms for a modern audience, the composer of the music stems for this title, Simon Viklund, has made it clear that his work on the title is formulated from covers of Junko Tamiya's original work on the NES version of the game, stating that:

> I just don't want to take too much credit for it, I mean, these songs are remakes. They have the same melodies and harmonies. I didn't write those, those are from back in the original game, and a lot of the reasons that people like them is the nostalgia factor. They recognize the melodies and appreciate how they've been treated.[42]

Earlier versions of *Bionic Commando* include a re-imagining of the arcade game on the Nintendo Entertainment System / Nintendo Famicom, released in July in 1988, for which Junko Tamiya, a colleague of Harumi Fujita in the Capcom Sound Team, handled the conversion, adding new material. The NES soundtrack features new material for the title; only two of the tracks from the original arcade release appear in the converted version. In turn, the NES version became a source of inspiration to Follin's later conversion and composition work for home computer releases in September 1988, incorporating Tamiya's NES *Bionic Commando* composition. This is itself takes Fujita's original arcade "Bionic Commando Theme" and "Heat Wave", as the starting points for Follin's arrangement of the "Stage 2 Theme" in the Commodore 64 and ZX Spectrum home computer ports. This demonstrates a dynamic process of influence and reinterpretation. Yet, again, the original composers do not appear on the credits roll of for *Bionic Commando: Rearmed*.[43] A sequel to this version was released in 2011 on home console and computer platforms, again scored by Simon Viklund utilizing original material alongside some covers of Tamiya's NES soundtrack. Again, Junko Tamiya does not appear in the end credit roll at all.[44] Both of these omissions have been fixed on soundtrack albums of the two remakes where Junko Tamiya has been credited as one of the source composers, alongside Harumi Fujita.[45]

[40] Kwon [Metin Aydin], "Tim Follin Interview," *Lethal News* 6 (December 1990).
[41] Titled *Bionic Commando: Master D Fukkatsu Keikaku* in Japan
[42] Jayson Napolitano, "Comic Con 08: Interview With Bionic Commando Rearmed Composer/Director Simon Viklund," *Original Sound Version* (28 July 2008), http://www.originalsoundversion.com/comic-con-08-interview-with-bionic-commando-rearmed-composerdirector-simon-viklund/. Accessed 28 April 2020.
[43] MahaloVideoGames, "Bionic Commando Walkthrough – Credits," video, 7:17, 28 May 2009, https://www.youtube.com/watch?v=Ak-wbtb62Xc.
[44] MahaloVideoGames, "Bionic Commando Rearmed 2 End Credits," video, 4:06, 15 February 2011, https://www.youtube.com/watch?v=3JS3LCrfq5c.
[45] "Bionic Commando: Master D Fukkatsu Keikaku (The Soundtrack)," VGMdb [Video Game Music Database] (8 August 2009, last edited 30 September 2015), https://vgmdb.net/album/14901. Accessed 28 April 2020.

The final game score conversion under discussion here is the game *Ghouls n Ghosts*, produced in 1988 by Capcom on their fledgling CPS (Capcom Play System) hardware platform for arcade. The game is a sequel to their successful 1985 arcade game *Ghosts n' Goblins*. As is common in the arcade action genre, it features a male lone protagonist knight on a quest to save a kidnapped Princess from the clutches of Lucifer. The game is notable for its extreme difficulty and the necessity to perform a "double run" to complete, requiring the game to be finished twice in order for the player to be successful. The music for the arcade title was composed by Tamayo Kawamoto, who built on the sound and composition work by her colleague Ayako Mori for the earlier *Ghosts 'n' Goblins* arcade title. In the "Ending Theme" to the arcade game, Tamayo Kawamoto pays tribute to Bionic Commando, taking cues from her fellow team member Harumi Fujita's "Forest" theme. The game provides a rich audio experience. The music and sound design benefitted from the expanded sound capabilities of Capcom's new CPS (Capcom Play System) arcade system platform, which featured both upgraded FM synthesis and 8-bit sound sample capabilities for both music and sound effects. This allowed for a wider range of possibilities for the composer, especially in terms of tone generation and percussion. The credits in the home port are sparse once again; a single screen in the game's opening credits the porting team, crediting Tim Follin as "Musician". Although Kawamoto's original baroque themes as well as the musician's tone, instrument design, thematic, ornamentation and composition choices in the original works reside at the core of the work, a portion of the material is new. Follin took inspiration from the original themes, such as "Village of Decay" and "Crystal Forest" to reimagine the soundtrack for the ported version. Despite the 3-channel limitations of the hardware, particularly Follin's score for the Commodore 64 platform is widely regarded as a classic of the genre,[46] creating a realistic and atmospheric set of music tracks that morph into an underscore soundscape.

In discussing the three examples of *Commando* (1985), *Bionic Commando* (1987) and *Ghouls 'n Ghosts* (1988), it is apparent that the Japanese style of crediting in-game and at the back end of the game is visible only by completing the game in one play, on a single credit, or by inputting a cheat through a combination of buttons.[47] The original arcade versions only present the logo or name of the production company, Capcom, at the start of the game loading process, with credits often being hidden in high score tables or in hard to access ending screens. By contrast, the Western method employed in all the home computer ports we have looked at, credit the porting team at the start of the game. On loading the game (which can be a lengthy process) the credits are presented on the title screen, or rotated as part of the attract mode of the game in question, making a bold statement regarding their creators. This insight suggests that beyond constraints of data memory and screen space, there are also cultural differences that contribute to the invisibility of the Japanese Capcom Sound Team.

In summary, by applying a game archaeological methodology to the crediting practices of three of Capcom's titles, and in turn excavating their porting processes during the late 80s and 90s, we identified a diverse set of crediting practices that obscured the female members of the Capcom Sound Team. As we have shown, a complex set of politics played a role in preventing proper credit to their iconic and memorable video game music compositions at the height of their popularity. For example, there is the challenging issue of the use of pseudonyms and a company crediting policy that anonymises and hides the

46 High Voltage SID Collection Team, "HVSC's Top 100 SIDs, As Voted on by SID Fans," *High Voltage SID Collection* (5 July, 2000), http://www.transbyte.org/SID/HVSC_Top100.html. Accessed 28 April 2020.
47 "Ghouls'n Ghosts (Arcade)", *The Cutting Room Floor* (29 September 2019), https://tcrf.net/Ghouls%27n_Ghosts_(Arcade)#Hidden_Credits. Accessed 28 April 2020.

identities of its creative staff members. Furthermore, when games are ported, the porting musicians are credited, but not the names of the original composers, partly due to their anonymity, and partly due to limited game screen and memory space. This is exacerbated by routine exscription of women in popular video game histories. The idea that the ideal gamer is young and male stems from the action game era in the arcades, and by extension, as no information is available about the creators there also seems an unspoken assumption that these games are most likely created by young men.

However, during the last decade, there has been marked change in the awareness and acknowledgement of the contributions of these Japanese female composers to historical classic game titles and global music culture, due to ongoing endeavours in documentaries, in-depth interviews and databases. Remakes and reimaginings of video game titles, such as the *Bionic Commando: Rearmed* series and its remixed soundtrack, have helped to push awareness about the original composers into the public consciousness. However, more research is necessary, as demonstrated by our findings. Although credit is emerging where credit is due for the creative and, at times, innovative contributions by the original composers outside of the actual video games and their fans, this is some 30 years after the fact. Our conclusion is therefore not only that game industry histories need revisions that take into account hidden and marginalised identities of video game creators, but also that there is an urgent need to improve the protection of creators in the game industry, perhaps even a need for standardisation of crediting practices, comparable to the film industry. This is especially pertinent for remixed or arranged in-game music which carries over into the game releases themselves.