

Slower, Squashed and Six Months Late : Japanese Videogames in the UK, 1991-2019

James Newman

(College of Liberal Arts, Bath Spa University)

Abstract :

There is a growing body of English language materials on game history, whether scholarly overviews and readers (e.g. Lowood and Guins 2016; Wolf 2007); investigations of specific platforms (Arsenault 2017; Ruggill and McAlister 2015), more popular accounts of the industry and market (e.g. DeMaria and Wilson 2012; Forster et al 2005) including particular companies (e.g. Ryan 2012; Sheff 1993) and even the influence of Japanese games outside Japan (Kohler 2016). However, while such a detailed interest in gaming's past is encouraging given the almost breathless futurism of industry discourse (see Kline et al 2009), there is, as Grabarczyk (2018) and Wade and Webber (2016) note, a decidedly US focus to much of this work.

This paper seeks to address this issue in two ways. First, it presents a more nuanced account of the availability, role and meaning of Japanese videogames in the UK throughout the 1990s and beyond. To do this, this paper begins by exploring the institutional, infrastructural and technological conditions that gave rise to distinctive market and retail contexts that are unaccounted for in the largely US centric work on game history. The paper considers the impact of the staggered release schedules that saw Japanese games and systems launched months and even years later in the UK. By moving on to examine the practices of 'grey importing' and the production and advertising of devices intended to modify consoles and circumvent region and copy protection, the paper discusses techniques that allowed the cognoscenti some means of accessing titles prior to their official UK/European releases. By surveying UK print magazines from the 1990s, I hope to offer insight into the repertoire of expert practices undertaken by Japanese videogame fans in the UK and the spaces and contexts that shaped these manifest performances of connoisseurship. What is especially notable about this distinctive UK-Japanese grey import marketplace, however, is that it was all but eradicated in this form in the mid-2000s as platform holders took high profile legal action.

Second, the paper moves to exploring the ways in which Japanese games were transformed as they crossed national boundaries and entered UK homes. Here, while recognising the vital importance of such work, I wish to move beyond discussions of linguistic and cultural transformations arising from translation and localisation processes (e.g. O'Hagan and Mangiron 2013) to an analysis of the often profound influence of underlying national broadcast standards on the aesthetics, experience and materiality of videogames. Examining a case study of Sega's flagship Mega Drive title Sonic the Hedgehog (Sonic Team, 1991), the paper explores how differences between Japanese and UK television specifications lead to the distortion of graphics and the deceleration of music and gameplay. Slower, squashed and six months late.

OVERVIEW

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2012; Forster et al 2005) including particular companies (e.g. Ryan 2012; Sheff 1993) and even the influence of Japanese games outside Japan (Kohler 2016). However, while such a detailed interest in gaming's past is encouraging given the almost breathless futurism of industry discourse (see Kline et al 2009), there is, as Grabarczyk (2018) and Wade and Webber (2016) note, a decidedly US focus to much of this work. Perhaps most emblematic of this tendency is the centrality of the 'great videogame crash' (see Wolf 2012). The story will be familiar even to those with but a fleeting interest in videogame history. A marketplace decimated by low-quality products (with the blame often unfairly laid at the door of the Atari 2600 conversion of ET and Pac-Man) and shattered consumer and retail confidence is reborn as Nintendo releases its NES console. An oversimplification, for sure, but also a narrative that describes the distinctive North American situation. In the UK, and indeed across Europe and other parts of the world, there was no crash. As Gazzard (2016) and Wade (2016) have noted, general purpose home computers such as the BBC B, Commodore 64 and Sinclair Spectrum, dominated the UK gaming marketplace with the Sega Master System being the leading dedicated videogame console. Even when the NES finally launched in the UK four years later than in Japan and two years after the US market began its recovery, an almost non-existent retail distribution network ensured that the system made little impression on UK home computer users and only the merest dent in Sega's dominance of the console market.

As such, at least part of the objective of this research is to present a more nuanced account of the availability, role and meaning of Japanese videogames in the UK throughout the 1990s and beyond. To do this, this paper begins by exploring the institutional, infrastructural and technological conditions that gave rise to distinctive market and retail contexts that are unaccounted for in the largely US centric work on game history. The paper considers the impact of the staggered release schedules that saw Japanese games and systems launched months and even years later in the UK. By moving on to examine the practices of 'grey importing' and the production and advertising of

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The second half of this paper moves to exploring the ways in which Japanese games were transformed as they crossed national boundaries and entered UK homes. Here, while recognising the vital importance of such work, I wish to move beyond discussions of linguistic and cultural transformations arising from translation and localisation processes (e.g. O'Hagan and Mangiron 2013) to an analysis of the often profound influence of underlying national broadcast standards on the aesthetics, experience and materiality of videogames. Examining a case study of Sega's flagship Mega Drive title Sonic the Hedgehog (Sonic Team, 1991), the paper explores how differences between Japanese and UK television specifications lead to the distortion of graphics and the deceleration of music and gameplay. Slower, squashed and six months late.

Through this comparison of different instances of Sonic which are utterly different yet which run exactly the same code, I wish to expand the analysis of platforms and of the materiality of videogames to consider more carefully the interactions between gaming hardware and software and the underlying audiovisual display standards within which they necessarily operate. These differences in international specifications for audiovisual input and output have manifest and material impact on aesthetics, gameplay and game feel. I argue that recognition of these factors is of foundational importance to game studies scholarship as it affects our ability as researchers, archivists and historians to speak with confidence about the boundaries of our objects of study. As we shall see,

the concerted project of silencing UK Sonic, both as an object of discussion and of play, raises important questions of authorial intent and originality, destabilises the notion of authenticity, and undermines the recounting and replay of region-specific gaming experience.

By highlighting some of the distinctive institutional, technological and ludic contexts in the UK, this paper seeks to contribute to the emerging body of scholarship that Wade and Webber (2016) have called 'local game studies' (e.g. Gazzard 2016; Wade 2016; Stuckey et al 2015). Additionally, thinking beyond the game, I wish to build on my earlier thoughts on the efficacy of media archaeology and documentary approaches to game history and preservation (Newman 2012a, 2016, 2017).

Accordingly, I wish to argue for a deeper consideration of the contingency of technologies such as visual displays and the attendant demands and specifications of region-specific video standards in our conception of a videogame 'platform'. Moreover, as the PAL version of Sonic becomes increasingly hard to access outside the original 1990s European Mega Drive hardware, this paper considers the implications for historians, archivists and preservation practitioners of this 'inherently unstable' (Newman 2012a) 'endlessly fragmented' (Giordano 2011) medium. In particular, the 'strategic forgetting' that sees PAL Sonic removed from Sega's re-releases and Mega Drive collections, leads to an effective canonisation of the NTSC version as the 'original'. And while it may have been the subject of the original Sonic Team's development efforts, the Japanese version of Sonic clearly does not constitute the 'original' experience for UK (or European and Australasian) gamers in the 1990s.

LOCALISATION, TRANSCREATION AND THE INHERENT INSTABILITY OF VIDEOGAMES

Recent scholarship (e.g. Bernal 2006, 2007; Mangiron 2007; O'Hagan 2007, 2009a; O'Hagan and Mangiron 2013) has drawn attention to the significance of language translation and other localisation factors

including accommodations for cultural specificities and sensitivities and the importance of shifting from the translation of text to the translation of experience and even the transcription of gameplay. As Costales (2012) notes, the localisation of non-linear narrative games can present a significant resource challenge given the lengthy and complex scripts with multiple characters and dialogue 'trees' these titles often include. In addition to dialogue, the sheer amount of weapons and locations requiring description and naming, as well as the countless other assets in need of translation and explanation, mean that Role Playing Games developed in Japan (and in Japanese) such as those in the Final Fantasy series, require considerable work before they can be brought to non-Japanese speaking audiences (Mangiron 2004). Nowhere is the enormity of the task more evident than in games such as Nintendo's *Animal Crossing: New Leaf*. Comprising a script of more than 2.4 million Japanese characters, the localisation project took three years and involved the work of all 50 of the translators and editors in NOA's 'Treehouse' localisation and quality assurance division (Schreiber 2014). Crucially, as the game's localisation manager Reiko Ninomiya notes, the resulting 1 million word English script was not simply a translation of the Japanese original but rather is arrived at through a lengthy process in which broader cultural specificities such as holidays and celebrations were adapted while finer details including the tone and personalities of individual characters, their senses of humour, narrative arcs and interactions with other characters and the player, were often newly created and move some way from the source material.

The pioneering work of scholars such as O'Hagan and Mangiron (2013) in the field of videogame localisation studies is invaluable in foregrounding what I have previously referred to as the 'instability' of videogames (Newman 2012a) and what Federico Giordano (2011) has called their 'endless fragmentation'. By referring to their instability, I mean to draw attention to the inescapable fact that any given videogame goes through a series of transformations as it moves across different boundaries and borders. As localisation studies eloquently demonstrate, these boundaries can

be both linguistic and cultural and the alternations might, and frequently do, impact with great significance on the content of games. The increased prevalence of the portmanteau word 'transcreation' can clearly be read as an attempt to showcase and account for the extent of creative input beyond language translation that goes into the process of localisation (Gaballo 2012). And, while there are occasions when the effects of such work become a matter of more public discussion and debate as with Birdo's gender in the Super Mario Bros. series for instance (Webster 2009; Kohler 2008), awareness of the kinds of transformations videogames undergo as they are translated and localised has only recently become a matter of mainstream coverage and even then is reserved for celebrations rather than critical interrogations of the work of high profile groups like Treehouse (Schreier 2014). That Animal Crossing: New Leaf is translated should immediately make us mindful of the potential for variation, that it is effectively rewritten in the process of localisation should leave us in no doubt that what we are dealing with are, effectively, two games that are the same but different - related to one another but sufficiently distinctive to warrant their own classificatory recognition. Whether we treat one as the original and the other (or 'others' as this game is translated into more languages than English) as versions or instances, or whether each might be considered as parts of the constellation of New Leaf, is an issue we will encounter later in this article. For now, however, before we factor in the influences of release, re-release and the importance of historical era, technology and platform in contributing to the instability of the game, it is essential to recognise how extant scholarship has positioned the influence of geography and region on the materiality of the game and a player's experience of it.

The extent of the often otherwise invisible creative labour revealed through the study of localisation as well as its impact on those creative labour practices in shaping what we might view as 'Japanese' game content are among the reasons why such enquiries are of vital importance. However, the position of localisation within the wider game development process is similarly

impactful for non-Japanese audiences. Ninomiya's description of the New Leaf process remains relatively uncommon in that the localisation ran concurrent with the game development. It is far more usual, and even commonplace within Treehouse as Schreier (2014) notes, for localisation to come towards or at the end of the development cycle. This does not necessarily mean that the creative input is lessened but does go some way to explaining the staggered release schedule for many Japanese-developed games. For gamers in Europe, the necessity to translate into multiple languages, which traditionally and minimally included FIGS (French, Italian, German and Spanish) but has extended as the marketplace expands, adds further to the release schedule. The economic requirement for a single 'European' release comprising multiple language translations rather than producing separate versions for what would be less viable markets provides at least one explanation for the sometimes significantly later releases of Japanese games in this region.

GREY IMPORTS, MODCHIPS AND THE FORGOTTEN ECONOMY OF BUYING JAPANESE GAMES IN THE UK

Importing a Japanese cartridge into Europe might seem like the obvious solution to the problem of differential release schedules yet this was actually far from straightforward. Even those players able to cross a language barrier themselves and who did not require a bespoke translated or localised edition of a game would still be confounded as region-specificity was actively enforced through various technical measures and through system design. At the time of writing, Nintendo's UK and Ireland corporate website sets out its case for region locking in terms of ensuring compliance with regulation across different territories.

Regional locking enables Nintendo to include parental controls in both its hardware and game software, enabling compliance with different age-rating models throughout the world. (Nintendo (UK) n.d.)

As such, we find the specificity of geographically-defined regions is hardwired into the design of the videogame console. At least part of the rationale for

Nintendo's infamous '10NES' Checking Integrated Circuit chip was to restrict the use of imported cartridges on US NES consoles (see Altice 2015). Variations of the 10NES CIC were used in subsequent Nintendo consoles including the SNES and N64 throughout the 1990s and early 2000s. Like most developers of videogame platforms, Sega has employed various methods of region locking to ensure that systems sold in a given region could only play software designated for publication and sale in that same region. In addition to implementing code-based techniques, consoles such as the Mega Drive continued to deploy Sega's altogether more low-tech (but nonetheless effective) approach of making cartridges in different regions physically different shapes and sizes. By virtue of the differently sized and shaped plastic housing which contains the circuit boards and chips on which the game's code resides, Sega saw to it that a Japanese Mega Drive cartridge simply will not fit into the cartridge slot of a European Mega Drive. Other platform holders, including Nintendo, designed similar mechanisms into consoles. Supplementing the 10NES system, Famicom and NES cartridges differ significantly in size and shape with the latter mimicking VHS cassettes in keeping with the console's home entertainment (re)design (O'Kane 2015). The cartridges also have a different number of pins on their connectors adding a further layer of direct incompatibility. However, all is not quite as it initially seems as enthusiasts have recently discovered that some of Nintendo's own NES titles, including some copies of Gyromite and Excitebike, actually shipped with Japanese Famicom hardware inside the NES cartridge case. The game was rendered playable by way of an internal 60-72 pin converter designed into the NES cartridge which effectively defeated part of the company's own region lock protection. Once revealed, these adapters could be repurposed to convert other physically disassembled and extracted Famicom game boards (Edwards 2005). As Altice (2015) notes, this situation arose as a consequence of Nintendo attempting to manage its inventory and stock.

Notwithstanding the sometimes unexpected nature of what actually lurked in the cartridges themselves, the

creation of these seemingly unbreakable hardware and software ecosystems that through code and physical design, territorially-tied games and consoles together, meant that to import a game also implied importing a console on which it could be played. Given the differences in power supply between Japan and Europe (and, indeed, between Japan, Europe and the US), this meant that the European player truly committed to importing Japanese Mega Drive (or NES, SNES, N64, Saturn or PlayStation) titles would also be in need of a step-down voltage transformer (as offered as part of a bundle through retailers such as London-based 'Skill Academy' for instance (C&VG September 1995: 86). Just as crucially, they would also need to find a retailer to supply the equipment. With mainstream retailers operating squarely within official distribution channels and carrying only the hardware and software designated for use within their territory's ecosystem, players without some other means of importing via friends or family in Japan had to actively seek out other retail opportunities. Fortunately, a burgeoning grey import market had developed across Europe to cater for the situation.

A grey import market, sometimes called a parallel import market, refers to one in which products are sold outside the usual terms agreed by a reseller and manufacturer as in the case of importing/exporting consoles and games intended for sale only in Japan. Typically, a grey import market operates through different distribution and retail channels and is often the preserve of smaller scale, independent operations¹⁾. In the UK, throughout the 1990s, the grey import market for videogames operated either via mail order or through small, independent stores which would advertise their services in the back pages of similarly independent gaming magazines. Surveying the monthly issues of UK magazine *Computer and Videogames*

1) Note the situation in Australia where price differentials have led some retailers such as JB HiFi and EB to grey import games from the UK (Parker 2012; Cochrane 2015); though see also recent discussions on the Goods and Services Tax in relation to digital products and services (e.g. Sanyal 2015).

(C&VG) throughout 1995-1996 reveals a variety of adverts²⁾. These range from adverts from platform holders and publishers relating to specific systems and games through to those from large (and largely defunct) high street chain stores such as Woolworths (1909-2009), Rumbelows (1969-1995) and Blockbuster Video (1989-2013), to independent bricks-and-mortar and mail order-only retailers listing their stock. Independent retailers taking out regular advertising space throughout the period include Special Reserve and Raven Games, while a section towards the back of the magazine (titled 'Local Buyers Guide' or 'CVG Directory') listed smaller stores organised by geographical region in the manner of classified listings familiar to readers of the UK music press of the period.

Where the larger high street retailers took out full page, glossy adverts replete with images of systems and screenshots from games, independent operators, such as Trico Consoles advertising in C&VG (February 1996: 35), typically opted for smaller (and therefore, cheaper) 1/3 or even 1/8 page adverts. Eschewing graphics and pack shots and bereft of any extraneous detail, these adverts were filled with dense text scrupulously set in an unadorned, fixed-pitched Courier typeface. Their lack of corporate imagery and the palpable dedication to efficiently listing available hardware and software served to underscore these stores' existence outside the mainstream and almost theatrically communicated a sense of being run by gamers for gamers. These were places providing what the mainstream channels either would not or could not. And so, it was through these self-consciously independent stores/mail order operations that grey imported SNES and Mega Drives and later PlayStations, Saturns and N64s were available to UK players, along with consoles never released in the UK such as Nintendo's Virtual Boy and the associated libraries of games and peripherals. While

2) 1995-96 was selected for the sample here as, by this stage, the Mega Drive, SNES and, most recently, PlayStation markets were well-developed in the UK and speculation and interest in the Nintendo 64 was intensifying in advance of the system's (much-delayed) Japanese launch later in the year. Further delays would push the UK release of the N64 to the end of Q1 1997.

some companies signalled their wares by explicitly tagging them as Japanese (or US) imports, literate readers would soon recognise that, in this context, the use of the soubriquet 'PSX' generally referred to the imported Japanese PlayStation rather than its official UK counterpart.

Throughout the 1990s, Japanese imports of hardware and software carried a considerable price premium with costs routinely 25- 50% higher and sometimes rising to in excess of twice the amount that the officially released titles would eventually sell for in mainstream UK retailers. By way of example, C&VG (September 1996: 41) carries an advert for Logtec advertising imported Japanese N64 games at £85 with Japanese PlayStation titles such as Tekken 2 listed at £75. When officially released many months later, N64 titles would retail for between £49.99-59.99 with PlayStation software typically priced at around £44.99. In fact, there were more than just the immediately recognisable home consoles on offer with retailers such as the London-based 'Hearts Leisure' also including arcade boards and peripherals suitable for use with 'SuperGun' devices designed for compatibility with JAMMA-standard Coin-Op systems and offering arcade sound, graphics and gameplay in the home (C&VG February 1995: 56)³⁾.

It is interesting to note that the independent retailers advertising in magazines such as C&VG often sold and listed videogame hardware and software alongside other imported Japanese media such as animation - still routinely referred to as 'Manga Animation' as in Hunter City Co.'s 1995 advert (C&VG February 1995: 71). The connection between anime and games here clearly inscribes a reader and consumer well-versed and literate across Japanese popular culture. The discursive effect of such adverts is to

3) PCBs (Printed Circuit Boards) designed for arcade cabinets and conforming to the JAMMA standard (Japanese Amusement Machines Manufacturers Association) could be played in the home via compatible 'SuperGun' hardware devices. These replicated arcade machine hardware and operation and did away with the need for the bulky cabinet, coin collecting box and audio, video and control wiring looms.

further draw attention to the comparative lack of availability of Japanese games and anime through mainstream retail thereby positioning acolytes and fans as dedicated and discerning and, above all, not well-served by the official channels of distribution. This echoes Jenkins' (2006) discussion of the subcultural practices of anime fans and amateur subtitle creators importing titles unreleased in the US and working on the VHS cassettes to translate them into English (see also O'Hagan 2009b and Newman 2008 on videogame 'fansubbers'). By drawing attention to Japanese games that had not yet been - and might never be - released in the UK, as well as ways of playing Japanese arcade games via elaborate 'SuperGun' devices only available through independent channels and wholly unsupported by manufacturer and publishers, such advertising practices inculcate the idea that this material is too refined for mainstream consumption. A Bourdieusian reading would surely note how large a role these small ads play in validating players' operations at the margins as they define the markers of taste, value and distinction. In this way, the necessity, expense and inconvenience of importing Japanese games and modifying consoles might be seen to be transformed into desirable and performable parts of the repertoire of the connoisseur. And, as was the case with the anime importers and subbers Jenkins documented, there was much more to being a fan of Japanese videogames in the UK during this period than having deep pockets. Although there is no doubt that importing games was expensive in monetary terms, the dedicated connoisseur of Japanese gaming also required considerable access to social and cultural capital as working with imported titles comprehensively eradicated the putative simplicity of the plug-and-play console. Even noting the presence of advertisements for importers above, players had to know where to look and how to decode the often cryptic text and listings (knowing what a 'SuperGun' was or recognising the importance of the bundling of 'RGB Cables' to render console output compatible with UK TVs, for instance⁴).

4) The significance of 'RGB cables' related to the 60Hz refresh rate of the Japanese NTSC console system and

MODCHIPS, BOOTLOADERS AND REGION CODING

While purchasing imported hardware and creating a 'virtual Japan' complete with a 'step down' 110v power supply in one's living room in London was clearly an option and retailers and importers existed to aid with the necessary purchases of hardware and software, the social and cultural capital acquired by those participating in the independent retail and grey import sectors led to other opportunities. Enter the modchip. These deviously intricate and often unimposingly small pieces of equipment enabled players to bypass the region checks that underpinned manufacturers' region checking and locking. There was not much a modchip could do to resize your cartridges (though there were adapters for that job), but it could convince a piece of Japanese software that it was running on the Japanese console it expected and not a modified European one masquerading as such. Modchips came (and, indeed, come) in all shapes and sizes with each requiring different degrees of warranty-voiding, soldering skill-testing installation. Regardless

communicated to the aficionado that they would require a TV/display capable of accepting such a video input. This was typically available via a fully-wired 'SCART' connection. Alternatively, some consoles made use of the 'S-Video' connection (either via an appropriately wired SCART connection or the more usual mini DIN connector). Neither SCART nor S-Video connections were standard on UK domestic TV sets of the time. Indeed, even where a SCART connection was available, it was common that the socket did not have all pins wired meaning that only composite video signals complying with the PAL standard could be received and displayed. Without reception of the RGB video signal, console and TV remained incompatible. As such, while the information presented in these advertisements did not presuppose a technical understanding of video signal compatibility or of audiovisual interconnection protocols per se, an appreciation of the practical implications of such variations and the requirement for comparatively unusually specified equipment was absolutely paramount.

of their exact form, each was dedicated to the task of breaking the region lock and connection between hardware and software thereby reconfiguring the console ecosystem. Again, independent retailers offered products and services to fit the bill with a comparatively rare advert from Raven Games London obliquely advertising the option to 'Have your Mega Drive Converted to run every game' for £25 plus £6 postage and packing (C&VG February 1995: 56). While they were comparatively cheap, as modchips were widely available but not widely publicised or advertised (given their increasingly problematic status and the actions of platform holders as we shall see below), players were required to have access to the kinds of social and cultural capital, networks and knowledge, that is familiar in relation to other forms of fandom.

The PlayStation proved to be a particularly interesting console with a number of features apparently designed to predict and confound those seeking to circumvent its region coding and copy protection systems. As one of the first consoles to make use of optical discs and in the context of a PC market in which CD-writers and rewriters were increasingly commonplace and writable media increasingly inexpensive, Sony implemented a number of technical and marketing strategies. From a technical perspective, one of the things that made the PlayStation's protection system so ingenious was that it used properties of the CD itself and the processes of reading and writing data from and to it, to secure an otherwise trivially copiable media format. While even their own marketing materials suggested that the black write-surface of the disc was a copy protection feature, it was nothing of the sort (see *Technology Connections* (2018); and note the promotional video available at the PlayStation Museum (2009) which claims, 'Black ink is added to the plastic to give the CD its distinctive, cool PlayStation only look. This also helps to protect the CD from illegal copying.'). Rather, the patented process centred on encoding a distinctive pattern into a region of the disc that made reproduction impossible with commercially available CD-burners. According to Patent US6122739A 'Digital compact disc player security

system reproducing method and apparatus' awarded to Ken Kutagari and Tetsuya Hirano (1994),

In the preferred embodiment of the present invention, the system performs an initial check to determine whether or not the disc contains a "wobbled" code in the TOC (Table of Contents) area of the disc.

As such, although it was trivial to make an apparently perfect copy of a PlayStation disc using nothing more than a readily-available PC with a CD writer/rewriter, without the characteristic, and impossible to reproduce, patented 'wobble' in the Table of Contents data, the otherwise perfectly duplicated disc was useful only as a drinks coaster. As Wallach (2001) notes,

The PlayStation stores its games on standard compact discs, but Sony arranged for some tracks to have invalid checksums. No self-respecting CD burner would ever write invalid checksums, so the PlayStation only needs to validate that the checksums are, in fact, invalid to abort the game-loading process. It's easy to defeat the PlayStation's protection system by using a low-cost embeddable microprocessor and soldering a few traces onto the PlayStation's motherboard. The new chip watches the host computer as it reads data from the CD. When it sees a request for the invalid block, it clocks out the invalid data to the host computer, regardless of what is on the CD. You can download code for these chips for free, or you can ship your PlayStation to vendors who will "chip" it for a small fee. (Wallach 2001: 49)

Or you could just use a blob of Blu-Tac! For those fortunate enough to have purchased one of the first Sony PlayStations to be sold in the UK (a mere 9 months after it debuted in Japan), there was an unexpectedly easy workaround that allowed the European console to run software from any region. Unfortunately for Sony, if not for early adopters keen to explore the Japanese PlayStation's library, the system was as flawed as it was innovative. The region check was performed only once when a disc was inserted and, because of the imprecision of what was then the new

medium of CDs, there was some tolerance built into the timing of the reading of the region code check and the subsequent game data. As such, it was possible to boot the early European PlayStation console using a European disc from which the region data was checked and confirmed and then swap this out for a disc from another region from which the game code was run. But, swapping discs involves opening the drive door which, surely, would trigger the system to recheck the region coding? That's where the Blu-Tac comes in. For all its next generation levels of 3D graphics and processing prowess, the PlayStation had a reassuring old-fashioned CD drive mechanism. The hinged CD drive door had a protruding plastic peg that physically depressed a button inside the console's body when closed. By manually pressing this button - or better still, by forcing it down with a strategically-positioned blob of Blu-Tac - the console could be tricked into believing the door had remained closed while the player switched out their European boot disc for the grey imported game. Subsequent iterations of the console patched this issue and queried the disc more frequently. However, the principle of disc swapping was used elsewhere. Datel's commercially-available Freeloader tool for the GameCube (and other consoles) used a similar method of booting from a disc of one region before switching to another to defeat the lock on Nintendo's first optical disc-based console. For UK and European Game Cube players keen to explore the full library of the system, the Freeloader was an essential accessory giving access to games such as the original Animal Crossing which was never given a PAL release. By this stage, Datel was a name familiar to UK gamers seeking to expand their game collections to include titles not (yet) released. While the company's 'Action Replay' series of cartridges are perhaps most widely known as tools that allow the inputting of codes to modify gameplay elements such as the number of lives, amount of ammunition etc., the 'Pro Action Replay' cartridge for the Nintendo Super Nintendo Entertainment System and 'Pro CDX' for Sega's Mega CD peripheral also function to defeat region coding. Priced at between £40-50 which broadly equates with the price of a game cartridge for the associated UK system, Datel's

advertising for the Action Replay devices makes no reference to the means of acquiring the games via import channels (or the prices of those import games) but alludes to a vast library of unreleased titles unavailable to UK players.

Action Replay even works as an adaptor so you can now choose from the huge range of US and Japanese software and play it on your UK Super NES Console.

(Datel Electronics advertising, Games Master 1993: 126-127)

While it is important to note the impact and influence of the shadow economy of the grey import market and the central role played by the modchip and associated tools such as the Action Replay cartridge and disc-swap bootloader, in undermining the putatively unbreakable link between region-specific hardware and software, what is perhaps even more remarkable is that the end of this distinctive period of gaming history can be pinpointed with an unusual degree of accuracy. As we have seen, operation outside the official channels of distribution coupled with somewhat underground and occasionally cryptic advertising practices ensured that the grey import market was never truly mainstream or far-reaching. Unquestionably, the practices of importing Japanese games and systems or modifying hardware were always marginal and the back pages of magazines and PO Boxes of importers were ludic spaces inhabited by only the keenest and most particular of fans.

However, while the actions and choices of these players and the retailers, importers and other organisations along the distribution channel may have been comparatively marginal, they were far from inconsequential. Indeed, the influence was such that the grey import and modchip markets attracted the interests of platform holders such as Sony, Nintendo and Microsoft with the Xbox manufacturer telling CNN that 'Entertainment software piracy and the modification chips ('modchips') that enable it, pose a serious problem for the video game industry.' (Stout 2002). The explicit and unequivocal connection

between modchips and the use of illegally copied software mirrors the discourse of piracy more recently deployed by the videogames industry in relation to ROMs and emulation (see Newman 2013) and similarly sidelines the use of modchips to play legally imported software from other regions among other applications (Rasch 2002). Online retailer Lik-Sang bore the brunt of the platform holders' objections in 2002 and 2003 with a number of cases and injunctions resulting in restrictions on the sale of certain product lines including modchips and requiring the payment of damages in compensation for lost earnings (Fahey 2003). In 2006, Lik-Sang announced its closure following successful action taken by Sony to restrict the importing of its PSP (PlayStation Portable) console into Europe prior to its official release in the territory. For their part and hardening their position yet further in the light of this victory, Sony pre-emptively announced that it would proactively crack down on imports of its PS3 console, stating that it sought to 'protect European consumers from being sold hardware that does not conform to strict EU or UK consumer safety standards (due to voltage supply differences etc.), is not (in PS3's case) backwards compatible with either PS1 or PS2 software, will not play European Blu-ray movies or DVDs, and will not be covered by warranty.' (Boyes 2006). Reporting on the story, the BBC noted that Sony would 'use the "full scope of the law" to block the importing of PlayStation 3s (PS3) into Europe before its official release.' (BBC 2006). In the wake of the ruling on PSP sales in London's High Court (Hatfield 2006) and the very public flexing of corporate muscle in relation to PS3 importing 'pre-crimes', it is small wonder that independent retailers swiftly reorganised their business and the grey market for Japanese videogames all but disappeared from UK retail and the back pages of the independent gaming press. Which is not quite the same as saying the opportunities disappeared, of course (see Eisenbeis 2014, for instance).

Nonetheless, in 2018, hardware manufacturers clearly set out their stall, with Nintendo's (UK) corporate website reserving a section for a discussion of modchips.

Modchips are circumvention devices used to bypass the security measures embedded within Nintendo's console systems, including Wii. Modchips are soldered to the internal motherboard of the console, voiding the console warranty.

I want to play games released in the US or Japan on my Wii and I have been told that I need to 'chip' my European Wii to do so.

Regional locking enables Nintendo to include parental controls in both its hardware and game software, enabling compliance with different age-rating models throughout the world. Using a modchip or other method of breaking regional locking circumvents the security embedded within the Wii hardware system.

(Nintendo n.d.)

Although Nintendo does not explicitly point to the legality of using modchips (instead focusing on their installation voiding warranties and elsewhere noting the illegality of selling such devices), the inclusion of information on modchips under a general banner of 'Hardware Piracy' and alongside material on 'Counterfeit Hardware', 'Circumvention Devices' and 'Game Copiers', leaves little room for ambiguity on their corporate position. It is worth noting, however, that while videogame companies might adopt an unambiguously negative position in relation to modchips in public, 'mod makers acquire such advanced skills that game companies fight over hiring them. Mods are the boot camp for the technology industry.' (Kushner 2003).

In light of the complexity of working with modchips even when they were comparatively readily available, the expense of importing hardware and software, the inconvenience of swapping discs and converting voltages, and the sheer amount of knowledge and network of contacts one required to participate, it is reasonable to ask why players went to such lengths. As we shall see, there are a number of answers, but as we have suggested above, the performance of discernment, knowledge and connoisseurship is crucial. And central to this is the

ability to gain early access to games. In a marketplace as rapidly moving as videogames in which 'perpetual innovation' (Kline 2003) is standard operating procedure, six months is all the time in the world. Every month, magazines present a new raft of titles to purchase and play before moving onto the 'next generation'. Nintendo's full-page advertisement for what was then known as the 'Ultra 64' console initially seems jarring in deviating from the doctrine of escalating consumption by imploring players to 'Wait for it...' Of course, on closer inspection, the missive is actually asking UK players to refrain from purchasing one of the already available but 'less powerful 32 bit CD machines' (deftly avoiding naming the PlayStation or Saturn) in order to invest in Nintendo's vision of the future and 'the speed of the silicon cartridge' (CVG February 1996: 27). The renamed Nintendo 64 console would be released in the UK on 1 March 1997, nine months after its Japanese launch and, coincidentally, nine months after Kent-based 'Loaded Consoles' and other grey importers first ran adverts in C&VG taking pre-orders from UK customers for the Japanese console (C&VG Issue 175 1996: 45).

And the story was no different with individual games. While Tekken 2 was released in Japan on 29 March 1996, it would be another six months until European players first started grappling with Anna, Yoshimitsu, Heihachi et al, on 2 October 1996. It would not be many more months later that Japanese arcade-goers would start perfecting their Tekken 3 combos! As such, to be able to play Tekken 2 half a year before its official release in the UK was, for some at least, a price worth paying. In this import market we, perhaps observe precursors for the Greenlight or Early Access model that has become a mainstay of PC and mobile game development, or at least a similar motivation to play games at the earliest possible point of availability. Of course, the grey import revenue stream takes a rather more meandering route than in the case of Early Access and these are released rather than still in-development titles, yet with the eventual release of a title outside Japan frequently undergoing transformation in the localisation process, it is perhaps not overly fanciful to suggest that importing offered

access to the earliest form of the game.

Even though the global release schedules for many titles have begun to harmonise, many anomalies continue to arise that remind us of the nature of the disparities⁵⁾. Nintendo's 2015 30th Anniversary celebration of Super Mario Bros. certainly reflected the global nature of the plumber's reach and celebrity and was pegged to the Japanese release date of 3 September 1985. However, it seemed somewhat premature to UK gamers given that the original game - and even the NES console it ran on - was not released until May 1987⁶⁾. Of course, though it may have been historically accurate, celebrating Mario's 28th anniversary doesn't have quite the same ring! Nonetheless, even where just a few days separate the European and Japanese release, the cachet of owning - let alone mastering - a game not ordinarily available was another important factor and a key indicator for the aficionado gamer conspicuously demonstrating their connoisseur status (Ashton and Newman 2011). But, while early access and the performance of expert personhood (du Gay 1997) definitely had its lure, this was far from the only reason one might wish to acquire the Japanese rather than European release of a game.

(SUPER)SONIC

Turning our attentions to Sega's Sonic the Hedgehog, we see that the game's European release was unusual in coming in the same month as the Japanese debut (both of which were pipped by the North American release a month earlier, in fact). With early access effectively negated as a motivating factor, why then might the Japanese version of Sonic still hold value for the aficionado? Certainly, the boxart is different. Sonic's Japanese Mega Drive artwork is a riot

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- 5) Even where just a few days separate releases, commentators such as Rock Paper Shotgun still campaign for unified schedules (see Walker 2011).
 - 6) The release of the NES across Europe was staged with France, West Germany, Scandinavia and Spain receiving the console in 1986 and United Kingdom, the Republic of Ireland, and Italy, as well as Australasia not seeing a release until 1987.

of colour and a paean to 1990s design with primary colours and geometric shapes broadly echoing some of the design cues from the game's title cards. Already pronouncing Sonic 'The Most Famous Hedgehog In The World' (a claim with which Beatrix Potter fans might have some quarrel⁷⁾), the Japanese box emphasises speed and action.

Don't just sit there and waste your precious time. When you want to do something, do it right away. Do it when you can. It's the only way to live life without regrets.

Speed is self-evidently central to Sonic the Hedgehog with even the name of the character alluding to breaking the sound barrier. Indeed, as Blake (2014) notes, Sonic was a character designed from the ground up to function both as a corporate mascot for Sega and, just as importantly, as a direct competitor to Nintendo's family-friendly Mario. In the US, Sega's 'Genesis Does What Nintendon't' campaign drew perhaps the most explicit and public comparison between the two companies but even the briefest consideration of Mario and Sonic and the fundamentals of the respective gameplay mechanics in the title games reveals the degree of self-conscious differentiation: Mario is red, Sonic is blue; Mario collects coins, Sonic collects rings; more pertinently, Mario is slow and Sonic is fast (and can collect 'Power Sneakers' to run even faster); Super Mario grows bigger while SuperSonic goes even faster still. For Stuart (2017), Sonic's relentless speed makes for an unusual, even 'incorrect' game design that eschews the orthodoxy of gently revealing a level's spatiality and guiding a player through a game's challenges as espoused by 'player-centric' designers and critics such as Koster (2005), Fullerton (2008) and Adams (2014).

Sonic doesn't do this – all it establishes at the beginning is that speed is important. In a single

playthrough, you only ever get a passing feel for the levels; you miss vast areas – all the rules are broken. (Stuart 2017)

Considering the influence of pinball on Naoto Ohshima's Sonic the Hedgehog level designs is particularly revealing and Stuart goes on to describe the player operating right at the very edge of feeling in control - and perhaps even crossing over into feeling out of control - as they guide Sonic through the landscape like a spinning, bouncing ball bearing, 'attempting to influence its speed and direction through secondary inputs, through deft touches.' Of course, if we needed any further evidence of the importance of speed in Sonic the Hedgehog, we need only leave the game unattended for a few seconds whereupon the fourth wall is comprehensively broken as Sonic turns to face the player, tapping his foot impatiently, simultaneously reminding us of his absolute dependence on the player for interactive input while expressing his consternation at their intolerable inaction.

Continuing to drive home the almost singular marketing message, Sega of Europe's UK television launch campaign for the game echoed the US 'Nintendon't' strategy, albeit without directly naming the competitor in accordance with UK advertising practice and regulation of the time⁸⁾. Even without actually naming Nintendo, Sega's UK campaign left little to the imagination and signalled the superiority of the Mega Drive hardware and software. Over a montage of gameplay sequences including a bright and colourful Sonic bouncing (almost out of control?) around an equally vividly colourful 'Spring Yard Zone' (home to the most ostentatiously pinball-themed stages in the game), a voiceover assures viewers that 'Once you start playing Sonic the Hedgehog, everything else seems a little bit slow'. The TV spot is fast-paced and cut to accentuate the speed of Sonic's onscreen action

7) Beatrix Potter first published 'The Tale of Mrs Tiggly-Winkle', about a hedgehog living in a cottage in the Lake District, in October 1905.

8) Clarifications and current legislation came in 1994 with the UK Trademark Act and European Directive 2006/114/EC (Misleading and Comparative Advertising Directive).

in relation to the pedestrian pace of real world events including a ninja who attacks the player who, used to Supersonic timings, dispatches them with ease and, most importantly, with time to spare.

However, while the advertising message and the centrality of Sonic's speediness might have been consistent the world over, some regional differences were immediately obvious. Unlike the Japanese boxart with its almost gaudy colours, the European Sonic the Hedgehog boxart features exactly the same graphic of Sonic but is an altogether more sombre affair overall. An extremely muted colour palette of cream and brown replaces the vibrancy of the Japanese art and far more subtly drawn patterns combine with tasteful outline drawings of Dr Robotnik (and two of the creatures Sonic is tasked with saving) all of which recede into the beige background. The Japanese and European boxart images are clearly related to one another and share the Sonic graphic and stylistic cues, but where the Japanese version is bold, bright and perhaps even veers towards the brash, it is hard not to read the European edition as modest, safe and understated. Crucially, the European artwork is bereft of the richness and dynamism of its Japanese counterpart. In fact, significant though these packaging details are in and of themselves, the differences in the artwork styles are more than just skin deep. The two versions of Sonic's boxart actually possess a remarkable symbolic power and communicate important, if unexpected, qualities of the two versions of the game within the boxes.

Quite simply, the European version of Sonic the Hedgehog is not the same as the Japanese version. Or rather, it does not play the same as the Japanese version even though it runs exactly the same code and is, in some senses at least, exactly the same. This idea of being identical but different is absolutely crucial to our discussion. Where the processes of localisation and translation we have noted above involve the transformation of game data and code as phrases and elements of gameplay are modified and even newly (trans)created, here the movement of the game across national boundaries leads to transformations wholly unconnected with language or cultural specificity or the actions of translators and editors. These are not changes

to the code, but changes to the way the code runs. And the impact of these changes on the game's textuality and materiality, and the player's experience of its gameplay, are every bit as profound as any modification arising from localisation or translation practice. And where the Japanese Sonic's boxart is busy, vibrant and perfectly reflects the almost impossibly speedy gameplay, European Sonic's boxart is understated, restrained and sedate, perhaps unwittingly presaging the fact that the game inside the box runs 17.5% slower.

(SUB)SONIC

The music runs slower, the in-game counter runs slower, even Sonic himself runs slower. The entire game runs a full 17.5% slower. Perhaps the game was modified or rewritten to make it easier for European players by slowing down the action? Or perhaps this is a sloppy or poorly written conversion. But, while Sonic was converted to the Master System (and subsequently to countless other platforms including the Clickwheel iPod, see Newman 2012b), this is not the reason.

In fact, the difference is not with the game, per se, but with the console on which that game runs. The European Mega Drive is, by nature, a differently capable unit compared with its apparently identical Japanese counterpart. This is not a consequence of deliberate choices made by Sega to differentiate the systems or to favour one market over another. Rather, the European Mega Drive has to be a differently capable system because it has to connect to European television sets. The Mega Drive, whether Japanese or European, has no built-in visual or auditory display and, so as to maximise ease of use, was designed to be connected to a domestic television set rather than a bespoke monitor. However, domestic television sets in Europe conform to the European 'PAL' broadcast television standard which is different to the Japanese (and North American) 'NTSC' system to which Japanese Mega Drives are designed to connect. The variations between Sonic the Hedgehog as it ran in Europe and Japan in 1991 are a consequence of these differences on broadcast TV standards which were

established many decades earlier in the 1960s and 1950s respectively. Figure 1 shows some of the key differences between the specifications but the crux of the issue centres on the differences between the screen resolutions and refresh rates.

| |
|------------------------------------|
| Phase Alternating Line (PAL) |
| 625 lines per frame |
| 50 fields per second (50Hz) |
| (Actually 25 fields interlaced) |
| National TV Systems Council (NTSC) |
| 525-lines per frame |
| 60 fields per second (60Hz) |
| (Actually 30 fields interlaced) |

Figure 1: PAL / NTSC Key Specification Differences

In an era in which we have become used to digital audiovisual connection protocols such as HDMI that offer digital signal paths and plug and play functionality for devices as diverse as games consoles, personal computers, BluRay players and DSLR cameras, it is easy to forget that consoles such as the Mega Drive predate such technologies and relied on analogue connectivity to pass audio and video signals from console to TV screen and speakers. The standard hookup for the European Mega Drive came via the so-called 'RF' or Radio Frequency connection. That there was considerable signal degradation as part of the digital to analogue conversion from graphics chip to video output, and along the analogue line itself between the Mega Drive and TV set is well documented, as is the distinctive blurring, smearing and ghosting artefacts characteristic of Cathode Ray Tube (CRT) TV sets (see Bogost n.d.). The Mega Drive outputs a signal identical in format to that broadcast over the airwaves and attaches to the TV set via precisely the same cabling as that connecting a rooftop aerial intended to receive over the air broadcasts. As a result, the standards governing TV broadcasts in any given region necessarily govern the specification of the analogue audiovisual output of the Mega Drive. Effectively, the Mega Drive acts as its

own self-contained TV broadcast system operating within exactly the same technical constraints as any over the air broadcaster, or for that matter, any other contemporaneous audiovideo playback device such as a VHS player/recorder or Laserdisc. As a European PAL TV set expected a display updated every 50Hz, that was what a European PAL-format Mega Drive had to supply. However, as Sonic the Hedgehog had been designed with an NTSC display specification in mind and had a game engine that ran at 60Hz, the code would simply run slower on a PAL set where it updated 50 rather than 60 times a second. Every frame of animation, every beat of music, every tick of the counter was triggered less often in Europe than in Japan⁹⁾.

And it is not just that the game runs slower, European Sonic is also squashed and squat. Every aspect of the graphics are compressed. Not compressed in the way we have come to understand that term in relation to digital imagery where blocky artefacts betray attempts to reduce file sizes by discarding data as in the case of 'lossy' formats such as JPEG, for instance. Rather, this compression is an altogether more literal one. Sonic and the entirety of the graphical content of Green Hill Zone et al are squeezed top and bottom. Although it might immediately look like some editing has taken place, with shrunken trees and spheres apparently redrawn as ellipsoids, there is no conscious alteration of the graphical design per se, and no new creative hand is responsible for modifying the artwork. Nonetheless, the European Erinaceinae is lent a distinctly stocky stature compared with his rather more statuesque Japanese self.

There is no data missing, no pixel reimaged or removed. All are present, but all are squashed into a physically smaller space on the screen. Again, scrutiny

9) In fact, as the table notes, while the displays were updated at 50 and 60Hz, the full screen image is actually comprised of two sets of interlaced 'fields' Effectively, this means that odd and even sets of horizontal lines are drawn alternately but are seen as a single frame by the human eye. This interlacing and the visible horizontal lines comprising the picture are responsible for some of the distinctive qualities of CRT and videogame visual aesthetics as Bogost (n.d.) has noted.

of the PAL and NTSC broadcast specifications reveal the true reasons for the visual transformation. Here, the key is the difference in the vertical resolution of the two standards. With a picture comprising 625 horizontal lines, the PAL system actually specifies a considerably higher resolution display than NTSC's 525 (In fact, the viewable image is lower in both cases as not all lines are drawn on screen with some reserved for timing and synchronisation purposes and 'drawn' outside the visible screen area). However, as the pitch of the lines is different, the same image, comprising the same amount of information in the same number of horizontal lines, will appear compressed or vertically squashed on a PAL display where each line is closer together. The effect is a 'letterboxing' of the visual content with visible bars above and below the vertically compressed image. These blank bars comprise the 'additional' unused lines of PAL resolution and will be familiar to those viewing transfers of wide aspect ratio video (such as movies filmed in 1.85:1 and 2.39:1) to narrower displays such as domestic 16:9 'widescreen' TVs.

WHO CARES?

These transformations are not inconsequential or of only academic importance and their effects are far-reaching. Most obviously, the PAL version of Sonic the Hedgehog looks and sounds different. The screen borders are clear to see but Sonic's sonics did not escape alteration either. Just as the hedgehog ran slower, so too did the soundtrack and, while it is not quite a dirge, Green Hill Zone's musical accompaniment is an altogether more downtempo affair for European ears. Its iconic rhythms and melodies are rendered at the same pitch but with a dramatically reduced tempo. Where the music was once incorrigibly bouncy and demonstrably added to the palpable sense of urgency and freneticism that propelled the player onward while adding, almost organically, to the feeling of being in and out of control, the PAL rendition loses the upbeat insistency and is recast as a laid back arrangement. At this lower tempo, rhythmic elements become pedestrian and plodding while melodic flourishes and virtuosos

solos are played almost tortuously slowly as if being studiously, if inexpertly, rehearsed by a performer still learning and practicing the lines.

In case we think this is simply a matter of audiovisual slowdown, let us not forget that every aspect of the PAL game runs at subsonic speed. As such, all gameplay elements are decelerated with Sonic's movement through the world taking on the feeling of wading through molasses. Only by donning the Power Sneakers can PAL Sonic reach the speeds of NTSC Sonic in his regular footwear, 'So, if you have speed shoes on, the music sounds normal again!' notes Sonic speedrunner 'mike89' (mike89mkselite 2017)). The carefully crafted trajectories of Sonic's jumps, so crucial for attacking and defending and the subject of extensive refinement and tweaking throughout the design process, now feel as though they are performed in reduced gravity with PAL Sonic hanging mid-air like a pixellated amalgam of Michael Jordan and Neil Armstrong (see Sonic Retro (n.d.); Fasterholdt et al 2016; Fahey 2016). If 'game feel' (Swink 2009) is an important design consideration, this game's feel is completely and irrevocably altered by virtue of being run on hardware in a territory other than that for which it was designed.

What is so fascinating about these manifest transformations of the audiovisual and experiential qualities of Sonic the Hedgehog are precisely that they do not arise from editorial or creative processes or from any alternation of the code. In fact, it is better to say that the changes we note in Sonic arise because the code was not altered. It was perfectly possible to optimise titles for European PAL release as is evident with later titles in the Sonic series. However, for this flagship launch, a title trading on the notion of speed, Sega chose to release unoptimised code and sabotage one of the game's key selling points even if this act might only be noticed years later.

WHO NOTICES?

What the...? Is my Mega Drive dying?

What on Earth? Come on, speed up! I don't remember you being this slow!

(redhotsonic 2016)

A 17.5% reduction in gameplay speed would surely constitute a significant alteration to the fabric of any game. However, for a game that makes such great play of its pace not just in and of itself but by way of differentiation from the putatively plodding gameplay of the competition, it is especially transformative, injurious and impossible not to notice. As long as you have a point of comparison, that is.

With websites such as Digital Foundry¹⁰⁾ offering modern gamers the most intricate analyses of the minutiae of graphical, auditory and gameplay performance of videogames released on different platforms, it is important to remember that such ready availability of detailed comparative material has not always been within the grasp of the gamer. Throughout the 1990s, print-based gaming magazines remained a key source of information about current and forthcoming titles for players and would-be consumers. In the UK, multi-platform titles such as *Computer and Videogames* (known as *C&VG*) vied for shelf space with platform-specific publications such as *Mean Machines Sega* which dedicated their attentions to the Mega Drive and later the Saturn and Dreamcast. Aside from the very occasional VHS covermounts which presented brief promotional video materials of gameplay rather than comparisons of different regional variations, gamers extracted information about games by poring over text commentary and static screenshots (see Scullion (n.d.)).

With no reference point available in the gaming press and mainstream retail channels carrying only hardware and software in the official ecosystems, there were not only few opportunities for comparison but also few reasons for players to even consider that such a comparison would be necessary. Why would a European player encountering the release of *Sonic the Hedgehog* in 1991 assume that this was not the speed at which hedgehogs ran? Experiencing the PAL version causes a palpable dissonance for many players whether they are returning to it through reviewing previously captured video or encountering it for the first time.

I don't exactly remember playing it this slow before which in time has made me ask myself 'How on earth did I live with this? Well, mainly because when I was a little kid, I didn't know any better. Yet, in 50Hz it was still pretty speedy compared with other games like Mario.

(redhotsonic 2016)

Reviewing the first video recorded speedrun of Sonic which, unlike subsequent runs, was performed on PAL (and video recorded on VHS cassette), the current world record holder, Mike 'mike89' McKenzie appears shocked at the re-encounter with the 50Hz version. As one of the most accomplished Sonic players, it is clear that mike89 is fully aware of speed differences between 50Hz and 60Hz operation and now runs the game exclusively in NTSC format. However, hearing just a few bars of the title music clearly reactivates the forgotten memory of just how slowly PAL Sonic runs.

'Anything sound slightly off to you? My God, this is how I used to have to play Sonic games when I was a kid! ... The thing that really makes me think is that I had to actually play it like this back in the day!' (mike89mkscelite 2017).

As the commentary continues, it becomes clear that the speed of the PAL game alters the challenge and even allows the on-the-fly adjustment of techniques, 'That whole thing there happened so slow that I was able to see that that jump was wrong and save it.' Similarly, in an otherwise critical examination of the shortcomings of the PAL version, redhotsonic's analysis points to the comparative ease of playing the game at a slower pace.

Well, funnily enough, 50Hz does have its advantages... For me, I have quicker reaction times in 50Hz... Let's use *Labyrinth Zone's* Boss as an example... It was extremely rare that I would ever fail it. And when it came to 60Hz, I did certainly struggle with it and now I can see why everyone else struggles with this Boss... In fact, I've never defeated him once in 60Hz.

10) <https://www.eurogamer.net/digitalfoundry>

(redhotsonic 2016)

As we noted above, where Mario collects coins, Sonic collects rings. However, the differences between these two collectibles are more than visual or symbolic and in Sonic's world, the possession of at least one ring bestows a level of defence against enemy attack that broadly equates with Mario's Power-UP Mushroom. Moreover, completing an Act in possession of 50 or more rings opens up a Special Stage in which Sonic bounces around a rotating playfield - part maze, part pinball machine - in search of a Chaos Emerald. There are six Emeralds available in total and the Special Stages become more complex to navigate as the player progresses through the game. As they provide a means of defence and unlock further gameplay opportunity (as well as points), maintaining possession of rings is key to success in Sonic and, as redhotsonic notes, the pace of PAL Sonic's gameplay affects the challenge.

Because of 50Hz, I was able to keep my rings a lot more by avoiding badniks and other obstacles and that way I was able to enter the Special Stages pretty much every single time at the end of Act 1 and 2. Speaking of Special Stages, these are a lot easier in 50Hz as well because of reaction times. Because it spins a lot slower than it does in 60Hz, I'm able to time my jumps at the correct time and able to go where I want to go. I didn't fail the Special Stage once in 50Hz... In 60Hz, though, it's a completely different story. There were loads of times I failed because it's going too fast and I wasn't able to time my jumps correctly. And, if you ever hit that 'Up' orb in 60Hz it obviously goes even faster so God help you!

Because I failed a fair few times in 60Hz, it wasn't until Starlight Zone until I was able to get all the Emeralds whereas in 50Hz, I was able to get them at the end of Spring Yard Zone, Act 2.

(redhotsonic 2016)

And so, it is not just that PAL Sonic looks and sounds different or that the reduction in pace is at odds with the Sega's marketing and design messages for the game, but that the deceleration actually makes the

game different - and subjectively easier - to play. Because the in-game clock ticks slower in Europe than in Japan, superplay practices such as speedrunning have no transferability. Indeed, as mike89 notes, 'PAL speedruns is basically an oxymoron at this point' (mike89mkscelite 2017). Consider the situation in which two identical sets of inputs are performed by either a human and tool-assisted player in the PAL and NTSC version of Sonic the Hedgehog (see Newman 2008 for more on Tool Assisted Speedrunning). All else being equal, because the PAL and NTSC versions of the game run the same code with the timer triggered on a 60 frame cycle regardless of the actual operating speed of the console, the in-game counter will register the same time for both performances. However, in real time, as opposed to Sonic's in-game time, the PAL player will have taken longer. More importantly, they will have had longer. By slowing down the game, the PAL version of Sonic reduces not only the tempo of the music and the rapidity of enemy movements, but also the jeopardy of the gameplay as a whole. There is more real world time to react and perform. As Stuart notes, Sonic is a game that breaks many of the taken-for-granted assumptions of game design by refusing to offer overviews of spatial puzzles in favour of breakneck bursts through levels where the player almost feels as though they are hanging on rather than controlling. Adding time for consideration, reaction and increasing the tolerance for performance, can only serve to make the game materially different - and arguably easier - to play. Reactions need be less precise, imperfectly executed manoeuvres can be corrected in real time, and parts of the game can be accessed or completed earlier.

While the slower operation of 50Hz Sonic might make it an easier proposition for some players and unequivocally undesirable for speedrunners, digging into the comments on NeiCaelum's (2011) playthrough of PAL Sonic we find a fascinating mix of responses. These range from genuine surprise where players are confronted the game's performance differences for the first time to discussions about authorial intent and notions of originality and canonicity. What is notable here, is the importance of nostalgia and first contact

with the game which clearly tinges players' thoughts on the differences between Sonic's music and gameplay.

Ben Roberts: Personally, I prefer PAL-speed music over the NTSC equivalents. The slower music tempo feels right, somehow; it really feels like it suits every track in the game (except, perhaps, the title screen).

...

Teh0nex: +Ben Roberts The music sounds tired.

SethBlizzard: +Ben Roberts Curiously, from Sonic 2 onwards, the PAL version sounds the same as NTSC, at least in Iceland it does. But I hear ya, can't stand the PAL hatin', there's a magic over it. And yeah, some of the music in this game just has a better groove in PAL.

Ben Roberts: +SethBlizzard Indeed. The music in the NTSC version doesn't sound right... Almost as if it's on drugs.

...

Wreethee Faaangs: Ben Roberts Wouldn't you rather play it the way the developers intended it though? it's not fair to say that one sounds more right than the other considering one was a total mistake.

...

Andromeda: It feels slllloooooowww watching the european version now after being used watch US/Japan version on youtube (being that's the most common on here) probably the first european one i have watched on here, but back when i actually played it, it didn't feel slow, just normal.

...

Retro game reviews: This honestly to me sounds so much worse than the Genesis version. Yes i live in the US so im used to the much faster version and also i have a megadrive game and it will play just fine on my genesis xD

(NeiCaelum 2011)

Not only do we see in these discussions a convincing argument for the incorporation of player memory into the historical archive (Stuckey et al 2015),

they present a further dimension that 'ensures that the melancholic utterance "this isn't the same as I remember it" is grammatically and technically correct.' (Wade and Webber 2016).

In fact, while it is clear that many of the commenters above are encountering the differences between PAL and NTSC Sonic 20 years after the game's initial release, we do begin to note some references to the quality of UK/European releases and optimisations (or lack thereof) making their way into the discourse in the mid-late 1990s. C&VG's (1996: 80) review of the UK release of Tekken 2 reminds readers of the 'long and anxious' wait for the game's official release before disappointingly reporting that,

While the borders aren't massive... Unfortunately, the speed loss is noticeable to anyone who's played either the Japanese game or the arcade original. Surely, Sony could have spent a bit more time doing a better conversion? It's like playing in slow-motion!

However, even with this caveat and recognising that the transformations materially affect gameplay in exactly the same way as we saw with Sonic where graphics are distorted and the timings of moves are altered, the absence of a point of reference or an easy way to operate outside the official PAL PlayStation ecosystem, means that,

While those who've never played either the arcade or Japanese versions of Tekken 2 will be perfectly happy with the game, fans may be a little bit disappointed to find that all the timings of the moves have been changed slightly. But still, it's the best 3D fighting game on the PlayStation by quite a way and gets a high recommendation.

Even this slightly increased prominence given to discussion of the differences between PAL and NTSC performance as well as the reminder of the staggered release schedules provides us with another explanation for the existence of grey imports and modchipping. We noted above that getting early access to games is one

motivator, that those games were then understood to be 'better' clearly adds to the lure and cachet of the Japanese 'original' even if that desire for ownership and ludic opportunity cannot be acted upon. Moreover, that Namco were releasing slow and squashed Playstation games six months late in 1996 highlights how endemic PAL (un)optimisation was and reminds us that Sega were far from the only culpable developer and publisher. Indeed, some of Nintendo's highest profile and most critically acclaimed titles are subject to just the same graphical anomalies and slowdown. The Legend of Zelda: A Link to the Past (SNES) and Balloon Fight (NES) being just two high profile examples. In fact, the latter is a game whose unoptimised state has become the subject of more recent discussion among fans when it was re-released on the European Wii U Virtual Console running in 50Hz with slowed down music and effects. The titles of Phillips' (2013) article for Eurogamer, 'Nintendo using inferior 50Hz mode for European Wii U Virtual Console', and Biggs' (2013) piece for Nintendo Today, 'Wii U, Virtual Console and 50Hz: Why Is It Still A Thing?' are particularly revealing.

WHAT, WHEN AND WHERE IS SONIC?

Of course, what this reminds us is that, in 2018, access to 1990s games (including Sonic) increasingly comes via emulation rather than no-longer-in-production Mega Drive hardware. In principle at least, it should be easier to undertake the comparative analyses of Japanese and European Sonic that were far harder to contemplate in decades past when original, region-specific hardware was required to access each version. Certainly, as we have seen in the examples above, there are players whose YouTube videos showcase the differences between PAL/NTSC performance or that spark debate among players with a historical point of reference who encounter a 'new' version for the first time.

However, it is important to note that official re-releases of Sonic via Sega's numerous console-based 'Mega Drive Collections', the 'Sega Forever' mobile platform releases, and even the unofficial (and often

illegally 'ripped') 'ROMs' used in conjunction with PC-based emulators are almost exclusively based on the NTSC version with emulation applications themselves defaulting to the NTSC standard. As such, 1990s PAL playback is either wholly unavailable or, in some rare instances such as Sega's Sonic Mega Collection (GameCube 2002), hidden behind a circuitous series of controller inputs and revealed only as an object of curiosity. Through these concerted efforts of canonisation and selective forgetting, it is not just that the Japanese version of Sonic is most highly prized today, but rather that the very existence of other versions is effectively denied. Sega's ongoing programme of Sonic series and Mega Drive collection re-releases ensures that the performance of Sonic's code under (emulated) NTSC conditions has been elevated to become the version of record.

What is so fascinating about emulation technologies is that they have not only contributed to the circulation of games and circumvention of regional/territorial lock-outs, but also have simultaneously raised awareness of the specificities of historical display technologies (see Bogost n.d.). As Altice (2015) has observed, we must exercise extreme caution when dealing with 'ripped' files (or ROMs) as they always undergo some modifications as part of the extraction and preparation process while emulators perform in materially different ways (not only compared with reference hardware but between one another) thereby requiring detailed bibliographic and citation notes in recognition (see also McDonough et al 2010 on variations in emulator performance). If we continue to gain access to historical games via emulation and ROM files, we continue to open ourselves to the potential of further, perhaps even more hidden, transformations arising through the processes of data migration, duplication and execution. Indeed, as Frank Cifaldi (2016) noted, even Nintendo themselves may have fallen foul of the tell-tale signs of using ripped ROMs rather than original code with their releases of Super Mario Bros. However, central to my argument here is that, for all their many benefits, emulation technologies are also implicated in closing down the options to actively play and to compare different game versions. Chief among

the reasons for this claim is that emulators tend to default to NTSC 60Hz playback. Moreover, emulation tools are increasingly utilised by developers and publishers revisiting their back catalogues. Every time a re-release substitutes an unoptimised 50Hz edition for a 60Hz alternative, it takes part in a process of selective and strategic forgetting that makes recapturing the 'original' PAL gameplay experience progressively harder. Even the Wii U Virtual Console release of *Balloon Fight* was updated later in 2013 to run the 60Hz version thereby eradicating another memory of the European original.

As we have seen, the tone of the discussion among players and critics alike is unequivocal in rating the 50Hz PAL version as 'inferior' (Phillips 2013) and positioning the Japanese (or occasionally US) releases as the 'originals' (as in the *C&VG Tekken 2* review). Clearly there are important issues here relating to authorial intent and there must be some sympathy for the position expressed in these commentaries that refer back to the performance of the game on the original target development platform and the inability of the unoptimised PAL system to replicate the equivalent operating conditions. According to this logic, if Sonic Team and programmer Yuji Naka developed *Sonic* for the Japanese Mega Drive, then surely that platform must be home to the definitive version. All of which makes perfect sense if we seek to account for the Japanese experience of the game and consider the tools on which the Japanese developers most likely worked. However, the UK/European version of *Sonic* was released in unoptimised form and the particular combination of aesthetic and experiential transformations that it underwent by being run on a PAL Mega Drive do constitute the authentic and original experience for players in the 1990s. That these transformations are the result of interactions between code and the prevailing and pre-existing standards of analogue TV rather than an identifiable designedly intent, or even whether it is considered inferior, are noteworthy factors but surely do not ultimately affect the authenticity and status of the original artefact. For archivists and videogame historians, particularly those with an interest in accounting for histories of special

geographical regions, there is no doubt that these apparently re-released (but actually newly released) 60Hz/NTSC games do not represent the original European experience. Given the strategic centrality of emulation in extant amateur, scholarly and industry game preservation practice (Serbicki 2016) and the lure of software preservation techniques (Lowood 2013), the normalisation of the NTSC version presents a real challenge. While we might critique strategies based solely around retaining playability, the centrality of the 'original experience' that Swalwell (2013, 2017) has noted makes it essential that we incorporate a consideration of the local specificity of audiovisual displays. This is not merely in recognition of the near-fetishistic adherence to 'historical accuracy' that Swalwell recognises in many 'game-lovers' who act as both curators and audiences for game preservation and history work, but because of the utterly transformative nature of these technologies on the operation of code and the manifestation of games and gameplay.

As emulation and the availability of ROMs all but silences PAL games, one consequence for archivists, historians and enthusiasts is that recapturing the experience of playing (watching and listening to) *Sonic* in 1991 in the UK is unsustainably tied back to the use of vulnerable hardware. As such, I would argue that to effectively account for distinctive local experiences and uncover the contexts in which they were located, the historical record will necessarily have to be excavated and assembled from fragments of material drawn from archives of magazines (Wade and Webber 2016), player memory (Stuckey et al 2015), walkthroughs and video captured performance (Newman 2018).

CONCLUSIONS

Ultimately, my aim with this paper is to highlight a number of connected issues whose impact and implications will be felt by a number of different constituencies yet which are comparatively under-researched within extant scholarship.

First, I hope to contribute to the growing, but still comparatively small, body of scholarship on 'local game studies' and to add to work on the influence of

translation, localisation and transcreation by considering the under-researched impact of technological, institutional and infrastructural factors. Of course, there remains more work to be undertaken on the emergence and operation of the grey import market, the development, distribution and uses of modchips, their impact on retail, piracy, access to game libraries, and the performances of gamer identity, expertise and connoisseurship. However, in mapping the contours of distinctive local gaming contexts as well as the associated industries, products and practices that grew up in response, this paper continues the challenge to dominant discourses of game history.

For historians, preservation practitioners and game studies scholars, I hope also to demonstrate the need to extend our definition of the videogame platforms to incorporate audiovisual display technologies. This goes beyond recognition of the characteristic aesthetic qualities devices such as CRTs impart through their analogue sound and video performance to recognise the transformative impact of audio and video standards. These pre-existing and regionally-specific broadcast standards dictate the parameters of console design and operation and can have profound effects on the execution and experience of code. As we have seen in the case of Sonic the Hedgehog, Balloon Fight, Tekken 2 as well as countless other titles, this means that the same code may actually manifest with different timing, audio, visual and gameplay qualities, depending on where in the world it is run.

For archivists and cataloguers, the European and Japanese releases of Sonic, Balloon Fight, et al become intriguing classes of digital object, both identical and different to one another and perhaps better thought of not as separate games but as related objects collectively comprising the constellation of each title. Ultimately, what I hope to have demonstrated in this article is an extension of the terms of a videogame's 'instability'. While localisation and translation scholarship has shone valuable light on the editorial and (trans)creative transformations videogames undergo as they move across and between geographical, linguistic and cultural boundaries, I see to add a consideration of the impact of technical standards. This is not an instability

born of modifications to code, this is an instability arising from a fundamentally different operation of the very same code. It is every bit as influenced by the movement of the game across national/regional boundaries, but it is not a product of translation, localisation, language or culture. These under-researched transformations are the consequence of foundational differences in technological infrastructure and standards that underpin, precede and shape the console as a platform and affect the execution, reception and meaning of the game.

In sum, as game studies theorists, we have become well used to asking 'What is Sonic the Hedgehog?' whether through the lens of genre, textuality or design. By recognising the transformativity of the flow of games through time and space and across technologies and infrastructures, I hope to highlight the importance of also asking 'Where and When is Sonic?'

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