
game
player
narrative
simulation
religion
global
authority
avatar
WoW
representation
The Last of Us
death
resurrection
general
Let's Play
angel
undead
experience
virtual
identity
community
symbolic
salvation
image
PVP
PVE
clan
digital
wedding
XBox 360

# Issue 20 (2024)

**articles**



**reports**

**IASGAR PhD day reports**



**reviews**

Peer-reviewed Article

# Appropriating Platform History. The Impact of Latin American Clone Consoles, 1973-1994

Phillip Penix-Tadsen

**Abstract**
As a sub-discipline of game studies, the field of platform studies could benefit significantly by destigmatizing piracy and paying more attention to how clones, copies, knockoffs and bootlegs have contributed – and continue to contribute – to video game history and global game culture. Yet to date, myriad so-called *clone* consoles from Latin America and other regions of the global south have remained conspicuously absent from most scholarship on platform studies and video game history. Platform studies' overall focus on formal-market development tends to start and end with developers in the global north, while failing to account for how players across the global south have historically accessed games made for the Atari, Nintendo Entertainment System and other platforms. This article focuses on the historical contributions of clone consoles developed in Latin America from the 1970s to the 1990s, showing how they were much more than copies, and in fact laid the groundwork for the eventual development of sustained national game industries. Clone consoles from Latin America also reflect the ways local creators must adapt imported technologies to make them functional for local users, frequently leading to innovations and improvements on the originals. Together, the consoles examined here demonstrate that we cannot fully understand the history of video games or the evolution of global game culture without an appreciation for the contributions of piracy and unlicensed development in bringing game technologies to players across Latin America and the global south.



**Keywords**: Platform Studies, Piracy, Clone Consoles, Latin America, Brazil, Mexico, Argentina, gamevironments

**To cite this article:** Penix-Tadsen, P., 2024. Appropriating Platform History. The Impact of Latin American Clone Consoles, 1973-1994. *Gamevironments* 20, 35-87. Available at https://journals.suub.uni-bremen.de/.

The history of video game platforms is a reflection of global political and economic relations, and the development of these technologies demonstrates the diverse ways global game culture evolved along with home video game consoles. Too frequently, histories of games and game culture have focused solely on technologies that circulate within a formal economy, or solely on those that circulate in the markets of the global north, without attention to how informal development practices like reverse engineering and hardware localization have contributed to the creation of national video game and tech industries across Latin America and throughout the globe. In many countries and regions of the global south, a lack of official presence of game hardware and software companies such as Magnavox, Atari and Nintendo meant that the work of making those technologies accessible to players was the responsibility of local engineers, entrepreneurs, hackers and programmers. This article analyzes approaches to the history of so-called *clone* consoles from the perspective of platform studies and technological appropriation, arguing that a consideration of the role of piracy and informal technological production is necessary for a holistic understanding of video game platform history.[i] After a prologue analyzing the main case study, the 1973 Argentine Telematch console, the article reviews the relevant literature and methodological approaches, then turns to an analysis of several Latin American clone consoles, examining their historical contributions relative to the more widely documented history of mainstream video game consoles around the globe. This study aims to answer several key questions:



1. How did Latin American clone console developers contribute to technological history in the region?
2. What obstacles did they face and how did they overcome them? How did their appropriated technologies serve the needs of local players in ways the mainstream global industry did not?

3. Moreover, how can an understanding of technological appropriation and informal development practices enrich and diversify our comprehension of global game culture and video game history?

Ultimately, this article lays out a preliminary critical history of clone consoles in Latin America, suggesting that we cannot understand the history of video game platforms unless we understand clones.

## Prologue: Telematch by Panoramic

Claims to historic firsts are destined for critique and obsolescence, and yet they invariably point to important instances along a long-term trajectory of development. The Telematch by Panoramic ca. 1973 (figure 1), an Argentine clone of the Magnavox Odyssey home video game console, is of historical note for a number of reasons, though the background of its design and distribution are exceedingly difficult to reconstruct. To start with, according to Agustín Coto (2021) and Gonzalo Frasca (2021), the Telematch was the first video game console ever made in Latin America. Likewise, the original game *Fútbol* (transl. Soccer) (ca. 1973a), hardwired to the console, was likely not only the first video game developed in Latin America, but perhaps the first soccer video game, ever. If correctly dated to 1973, the Telematch appears to have been both the first home game console to run on plug-in electric current and the world's first portable video game console. It reached the Argentine market a year before the Magnavox Odyssey itself reached international markets such as Europe and Japan. And while dozens of other clone consoles from the early decades of video game hardware development in Latin America have been identified (see appendix), like the Telematch, their historical impact has yet to be fully appreciated and their significance has yet to be sufficiently acknowledged by the field

of platform studies or by most game historians.


Figure 1: A Telematch J5 console in the Museo de Informática, Buenos Aires, Argentina. © museoinformatic.

As with other clone consoles, the history behind the Telematch is not entirely clear, but many of its core elements can be pieced together. During a trip abroad, executives from the Argentine television and stereo company Panoramic obtained a Magnavox Odyssey – the world's first home video game console – soon after its release in 1972. In an email in September 2021, Ricardo Saucedo, editor of the

Argentine website compuclasico.com, explained to me what he knows about the history of the development of the Telematch, which is the closest I have come to identifying its developers:

> "Regarding the date of origin, the truth is I haven't found any documentation, although I do have some oral references. I mention on the page that Telematch had the idea of offering a PONG console around 1973, because some people who were involved in computing at that time commented to me in a conversation I had with them that the idea came to them almost immediately from the moment the Odyssey was released – from my understanding it was less than a year later. Apparently, they brought one back and took it apart to study it through a process of reverse engineering or 'cloning.' Unfortunately, I cannot provide any proof to corroborate this claim because the person who told me was a former colleague who had mentioned it in a casual breaktime conversation, and unfortunately he has since passed away." (Saucedo 2021a)[ii]

Though the details of this history may be lost, the Telematch is doubtlessly a rare and notable console. While over 350,000 Odyssey consoles were produced between 1972 and 1975 (Winter 2008, 51), the Telematch is one of only a handful of known Odyssey clones. Another example, the Overkal, appeared in Spain, while other notable examples from Latin America are the Argentine Videojuel as well as the Telebolito, marketed by department store chain J. Glottman in their locations throughout Colombia (Castiblanco 2014, 43, figure 2).



As Saucedo explains, upon their return to Argentina, the Panoramic team disassembled the Odyssey to determine how it functioned through reverse engineering. Unlike later video game consoles, the Odyssey platform runs purely on hardwired transistors and diodes rather than microprocessors. In place of cartridges or disks, the games run on "plug-in cards that essentially reconfigure the system's internal circuitry to make minor adjustments to the basic onscreen objects, which consist of a pair of paddles, a ball, and a line" (Weiss 2007, 247). The game selector

interface operated a physical switch within the console that selected the correct card to use, making the machine "far from all-purpose, much less programmable" (de Caso 2011, 7). Nevertheless, Panoramic's team found the Odyssey's operations simple enough to replicate on their own, and decided they would add a game console to their product repertoire as soon as possible.

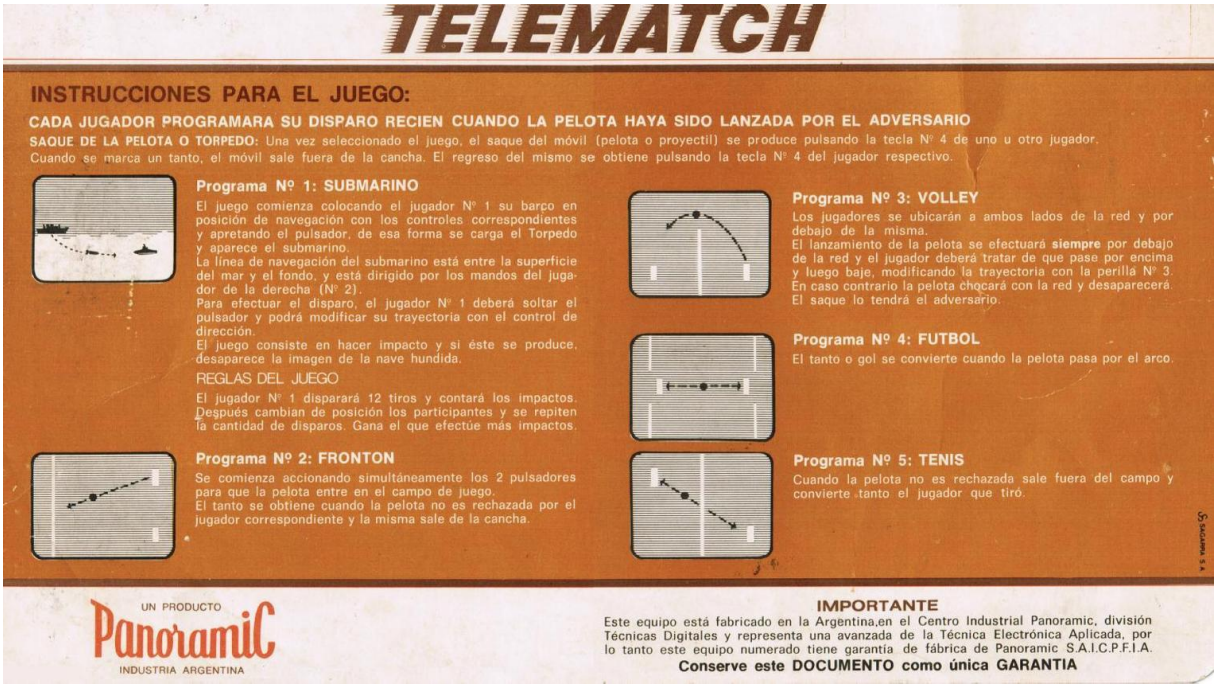

Figure 2: Telebolito, a Colombian console built on the Magnavox Odyssey platform. © 1quartodejuguetes.



But for the Telematch console, Panoramic decided to make a number of improvements on the original (Winter 1996, de Caso 2011, Chorgox 2020, Frasca 2021). First, they designed a carrying case to contain the Telematch, its five games and two controllers, repurposing hardware from other devices they already regularly produced, such as portable record players and stereo sets. This is notable, as

historical timelines of portable game consoles frequently begin with citations of Milton Bradley's Microvision in 1979. Improving upon the original Odyssey, the Telematch featured an on-screen score display, ran on plug-in AC power rather than disposable batteries, used a single cardboard instruction panel rather than a 20-page manual and contained at least two additional daughter boards to produce graphics for added games (figure 2). Finally, the Telematch did away with seven of the games included on the original Odyssey, many of which required overlays, cards and stickers that were to be placed on the television set during gameplay to add color and narrative dimension – but which many players also found to be superfluous window-dressing attempting to disguise the ball-and-paddle tennis game as something more. The Telematch included just five essential games: *Submarino* (ca. 1973), *Frontón* (ca. 1973), *Volley* (ca. 1973), *Ténis* (ca. 1973) and *Fútbol*.




TELEMATCH

INSTRUCCIONES PARA EL JUEGO:

CADA JUGADOR PROGRAMARA SU DISPARO RECIEN CUANDO LA PELOTA HAYA SIDO LANZADA POR EL ADVERSARIO

SAQUE DE LA PELOTA O TORPEDO: Una vez seleccionado el juego, el saque del móvil (pelota o proyectil) se produce pulsando la tecla Nº 4 de uno u otro jugador. Cuando se marca un tanto, el móvil sale fuera de la cancha. El regreso del mismo se obtiene pulsando la tecla Nº 4 del jugador respectivo.

Programa Nº 1: SUBMARINO

El juego comienza colocando el jugador Nº 1 su barco en posición de navegación con los controles correspondientes y apretando el pulsador, de esa forma se carga el Torpedo y aparece el submarino.
La línea de navegación del submarino está entre la superficie del mar y el fondo, y está dirigido por los mandos del jugador de la derecha (Nº 2).
Para efectuar el disparo, el jugador Nº 1 deberá soltar el pulsador y podrá modificar su trayectoria con el control de dirección.
El juego consiste en hacer impacto y si éste se produce, desaparece la imagen de la nave hundida.

REGLAS DEL JUEGO

El jugador Nº 1 disparará 12 tiros y contará los impactos. Después cambian de posición los participantes y se repiten la cantidad de disparos. Gana el que efectúe más impactos.

Programa Nº 2: FRONTON

Se comienza accionando simultáneamente los 2 pulsadores para que la pelota entre en el campo de juego.
El tanto se obtiene cuando la pelota no es rechazada por el jugador correspondiente y la misma sale de la cancha.

Programa Nº 3: VOLLEY

Los jugadores se ubicarán a ambos lados de la red y por debajo de la misma.
El lanzamiento de la pelota se efectuará **siempre** por debajo de la red y el jugador deberá tratar de que pase por encima y luego baje, modificando la trayectoria con la perilla Nº 3.
En caso contrario la pelota chocará con la red y desaparecerá.
El saque lo tendrá el adversario.

Programa Nº 4: FUTBOL

El tanto o gol se convierte cuando la pelota pasa por el arco.

Programa Nº 5: TENIS

Cuando la pelota no es rechazada sale fuera del campo y convierte tanto el jugador que tiró.

UN PRODUCTO Panoramic INDUSTRIA ARGENTINA

IMPORTANTE

Este equipo está fabricado en la Argentina,en el Centro Industrial Panoramic, división Técnicas Digitales y representa una avanzada de la Técnica Electrónica Aplicada, por lo tanto este equipo numerado tiene garantia de fábrica de Panoramic S.A.I.C.P.F.I.A.

**Conserve este DOCUMENTO como única GARANTIA**

Figure 3: Telematch instruction card, included with the original console, featuring explanations of *Fútbol* and the other four included games. © Phillip Penix-Tadsen.

The number of consoles Panoramic ultimately produced is unknown, but it is

estimated that at least 15.000 units were manufactured (Winter 1996). Marketing and promotional materials for the original Telematch model J5, along with Panoramic's 1977 consoles the Telematch J6 and the Telematch Junior, emphasize convenience and modernity. The single-page instruction card included with the unit announces that the Telematch is "a breakthrough in Applied Electronics Technology" and notes, "Telematch can work with any TV set in the country, regardless of the brand, year or model, at any time of the day or night, even if there is no television broadcast, because Telematch generates its own image" (Panoramic ca. 1973).[iii] It also offers instructions on how to best adjust the contrast and brightness settings to obtain an optimal image, in what was a hard-copy precursor to the typical audio-visual setting adjustment screens in contemporary video games. A Telematch Junior advertisement from 1977 highlights the "atomic" console's "Bionic Anti-Boredom Switch," a lever that allows the player to adjust the speed and thus the difficulty level of the game, as well as its state-of-the-art "Tri-Bionic Sound" (Peluso 2020).[iv] As Ricardo Saucedo (2021b) has observed, these materials reflect the popularity of two television series imported to Argentina from the United States around this same time, *El hombre nuclear* or *The Six Million Dollar Man* (1973) and *La mujer biónica* or *The Bionic Woman* (1976).



*Fútbol*, the only original game among the five included on the Telematch console, is the first known video game developed in Latin America (Frasca 2015, Frasca 2021). Without a definitive publication date, it cannot be determined whether it is the first soccer video game, as *Super Soccer* (1973) was among the best-selling arcade games of 1973 in the United States, and *Soccer* (1973) was released in November of the same year. But *Fútbol* was definitely not a copy of the 1974 version of *Soccer* included on international versions of the Magnavox Odyssey (Frasca 2021). The game included several aspects that made it unique, including the use of four characters (playing in

teams of two) along with the addition of two dials to the controllers to direct the goalies. The instruction card included with the Telematch console offers a succinct description of this historic game: "Program 4: SOCCER -- The point or goal is scored when the ball passes through the goalpost" (Panoramic ca. 1973).[v] Without a doubt, the addition of this game to the Telematch console represents an early example of cultural localization, given the predominance of soccer in Latin American culture and in Argentina specifically. As Frasca (2021, 15) succinctly states, "I am not arguing that Latin American identity necessarily has to revolve around football, but I am arguing that it was an essential element in the creation of this, likely our first console and our first video game." Without a doubt, the Telematch was a historically significant technological development for Argentina, for Latin America and for global game culture.



## Diversifying Platform History

As sub-disciplines of game studies, platform studies and video game history could benefit significantly by destigmatizing piracy and paying more attention to how clones, copies, knockoffs and bootlegs have contributed – and continue to contribute – to global game culture. Yet, to date, myriad clone consoles from Latin America and other regions of the global south have remained conspicuously absent from most scholarship on platform studies and game history. Due to the overall absence of attention toward the historical importance of clone consoles in Latin America, for example, we don't know the name of any of the collaborators in the development of the first video game console ever made in the region – the Telematch de Panoramic. We cannot definitively identify the year it was released on the Argentine market or the name of the programmer(s) of the region's emblematic first video game, *Fútbol*, included on the Telematch.

Platform studies, insofar as it has been defined by the eponymous series of books edited by Nick Montfort and Ian Bogost and published by the MIT Press since 2009, has indeed contributed a great deal to our understanding of video game hardware. However, this subdiscipline's overall focus on formal-market platform development tends to start and end with developers in the global north. As such, platform studies tends to overlook players in the global south, a region defined by nations and people who have endured colonization and continue to suffer the effects of colonialism and economic marginalization that places them at the receiving end of the consequences of globalization (Dirlik 2007, 16, Mignolo 2011, 185), and fails to account for how these players have historically accessed games made for the Atari, Nintendo Entertainment System and other platforms. In other words, if the subdiscipline of platform studies fails to account for clone consoles, it fails to account for the actual platforms used to access video games by players across *most of the world*.



Platform studies lacks diversity. Feminist scholars in particular have offered a well-grounded critique of this field, highlighting the ways a focus on the so-called *black boxes* on which games are played can divert attention from the role of the player, identity and subjectivity in general. Along the broader spectrum of platform studies scholarship, Arianne Renan Barzilav (2019) has examined the gendered inequalities inherent in gig economy labor platforms, while Verity Anne Trott explores uses of social media platforms by progressive social movements in the 2023 study *Feminist Activism and Platform Politics*. Likewise, Jean Burgess has demonstrated the ways that platforms not only have power within creative industries, but "that their logics – their ways of operating and their systems of value – are more deeply reshaping our society and culture" (2021, 22). With regard to game studies in particular, Aubrey Anable argues that a focus on hardware, software and platform can exclude important elements related to player embodiment, identity and representation: "focusing too

myopically on platforms, then, tends to reproduce histories and analyses that ignore the complicated differences and relationships between technologies as things and bodies as things – as systems differently encoded by race, ability, gender, class, ethnicity, nationality, and sexuality" (Anable 2018, 136). Likewise, Soraya Murray offers an extensive critique of Bogost's focus on hardware and software as an artificial separation of games from culture (Murray 2017, 30-32, 41-42). These authors' research demonstrates that our understanding of platforms is incomplete without an understanding of how they are experienced by users and how they work in context.

Likewise, the history of game software and hardware has failed to focus attention on software and hardware adoption in Latin America and other areas of the global south, and greater attention to local game histories and the appropriation of technologies would add important diversity and perspective to our understanding of the evolution of game technologies and cultures. For decades now, scholars have been pointing to the need for greater attention to practices of technological appropriation, for example in Ron Eglash's (2004, x-xii) distinction between practices such as reinterpretation, adaptation and reinvention, or Mikael Hård and Andrew Jamison's (2005, 15) argument that "processes of cultural appropriation" continually transform our realities and the artifacts that inhabit them. The latter offer a particularly poetic illustration of the way game history has celebrated the privileged while ignoring the marginalized, arguing that science and technology "have marched through the centuries with a Janus face, smiling on some and frowning on others" (Hård and Jamison 2005, 13). The analysis of François Bar, Matthew S. Weber and Francis Pisani (2016, 618-619) adds to this theoretical and critical frame by considering the particular appropriation strategies that have been used in Latin America across history – "Cuba and Mexico's baroque, Martinique's creolization, and Brazil's cannibalism" – and the ways these cultural frameworks of transcultural relationships

can inform our understanding of contemporary technological appropriation, constituting "a re-negotiation of the power relationships embedded in technology."

In a similar vein, Melanie Swalwell has argued:

> "The centrality popular game history has accorded the 'great men' of the games industry and their deeds (e.g. Ralph Baer and Nolan Bushnell), to the exclusion of other perspectives and approaches" and that "an appreciation of socio-cultural and geographic specificity is important to develop, particularly if other histories are to be told, for instance, from the 'periphery' rather than the 'centre'." (Swalwell 2021, 2-3)

For his part, Jaakko Suominen (2017, 548) has argued that game history can be best understood by identifying the author's approach, categorizing interventions as enthusiast, emancipation, genealogy or pathology. Among these categories, the present study most closely adheres to the definition of "emancipations," which aim "to provide contradictory, alternative, and enriching perspectives on history, or rather histories, of games (culture)" and "seek to inspire debate, not only in the wider researcher community but also among gamers and the public," therefore referencing "not only games, gaming devices, and interviews with practitioners as sources but also a plethora of paratexts such as game magazines, game critiques, advertisements, oral histories of gamers, online discussions, manuals, walkthroughs, and so on" (Suominen 2017, 552-553). These sources point to the multivalent patchwork of processes required to reconstruct the history of technological appropriation.



**The Politics and Economics of Latin American Clone Consoles**

From a geopolitical perspective, there is also a need to expand and diversify our approaches to studying and historicizing game hardware and platforms by examining the history of the clone consoles used by many players around the world both in the

past and today. Indeed, Montfort and Bogost leave room for the examination of clone consoles in the Platform Studies series, which aims to publish works that "focus on a single platform or a closely related family of platforms" (2009, vii) – thus, perhaps PONG clones, Atari clones, Famiclones or PolyStations could be included in the "families" of the platforms with which they are related. The series also promotes works examining "how computing platforms exist in a context of culture and society, being developed based on cultural concepts and then contributing to culture in a variety of ways" (Montfort and Bogost 2009, viii), making space for the analysis of how some of the dominant platforms were modified, localized and adapted by hardware engineers around the world. But in practice, Montfort and Bogost's (2009) *Racing the Beam* makes no mention of clones, modifications, knockoffs or copies in discussing the Atari VCS platform, even though that is how the platform arrived to the majority of the world. Therefore, the flagship work of the Platform Studies series lays out a very particular vision of video game history, one that focuses on the formal practices and markets of the global north, but overlooks the ways technologies have been incorporated into culture throughout much of the global south.



The histories of unlicensed consoles throughout the world are related to factors that are local in nature. For one thing, the hardware engineers who produced Latin American clone consoles filled in gaps that the mass market could not or would not fill. For example, in Brazil imported Atari consoles did not work with Brazilian television sets, leading to the development of the Polyvox console (Brito 2016, 19-20), an official Atari clone further discussed below. But there were other important local, national and regional factors that also impacted the history of the development of Latin American clone consoles, particularly the rise of protectionist and nationalist regimes in different countries throughout the region from the 1970s through the 1990s. These administrations frequently brought with them tariffs and restrictions on

importation along with requirements for national manufacturing of products that might otherwise bring about import dependency. In Mexico, the restrictive importation policies of President Luis Echeverría, who held office from 1970 to 1976, led to a creative approach by Mexican engineer Morris Behar Pérez, creator of the 1972 NESA Pong console, which is further discussed below. In light of a national prohibition on the importation of computer components, Behar reached out to the U.S. corporation National Semiconductor – producers of the chips for the Atari PONG home console – and arranged to import their discarded and flawed chips across the border as "junk," so that Behar could later assemble them into NESA Pong consoles (Sánchez 2022), making these technologies available to a much broader national audience than would have otherwise been possible. In Brazil, the protectionist turn took the form of the nation's first law regarding computational technologies, the *Computer Market Reserve in Brazil*,[vi] established in 1984, which stipulated that only locally designed minicomputers could be legally produced and circulated in Brazil (da Costa Marques 2015, 64). This too led to the creation of a workaround by local developers, whose executives and engineers hand-imported Atari 2600 consoles from the United States and then reverse-engineered the original components to design their own original clone consoles, beginning with the "Atari-compatible" CX-2600 console (Ferreira 2017, 74), released in Brazil by Atari Eletrônica Ltda in 1980, just three years after the release of the original Atari 2600 in the United States. The consoles developed during the Computer Market Reserve in Brazil were cheaper overall for local consumers than imported or black-market consoles, provided a greater variety of choices and range of prices, were more widely available and were more reliable than other available products (Falcão 2017). In concert, these and other local factors brought about the conditions for the development of some of Latin America's first video game hardware and software.

In ways, scholars have been taking note of the historical impact of clone consoles and related technologies for some time. For example, Ivan da Costa Marques (2005, 139-140) has studied the development of a Macintosh clone reverse-engineered in Brazil in 1985 by the corporation Unitron which, despite the reliability and popularity of its products, fell apart when attempting to gain formal status from Brazil's SEI (Secretaria Especial de Informática, or Special Computing Secretariat) and CONINN (Conselho Nacional de Informática, or National Computing Council). And in the case of Taiwan's computer hardware industry, Honghong Tinn (2011, 75) has located its origins in the tradition of tinkering and DIY computer building, a history which differs considerably from the Latin American hardware examined in the present study, which were largely the products of existing consumer electronics companies that shifted to production of video game hardware and software. More recently, in *Minor Platforms in Videogame History*, Benjamin Nicoll (2019, 14) argues that studying less-known examples of video game platforms can foreground important issues for platform studies, bringing scholars "to question what we think we know about video game history and the ontological stability of our object of study." Indeed, attention to game hardware and software development outside the supposed centers of global game development can teach us a great deal about how games are developed, adapted and played in different cultures and geographical locales – and in fact, our understanding of video game history is incomplete without taking this into account.



While platform studies and game history could stand to focus greater attention to pirated consoles and other so-called minor platforms, Nicoll is not the only one to recognize the importance of clone consoles, piracy and the informal economy in accounting for the history of video games and game culture. Platform studies scholar Nathan Altice (2015) and game historian Tristan Donovan (2010) include an assessment of pirate practices in their works. Likewise, game studies researchers

including Brendan Keogh (2019), Stephen Mandiberg (2021) and Thomas H. Apperley and Jussi Parikka (2018) have highlighted the potential benefits of approaching platform studies with an eye to diverse perspectives and contributions including "informal video game development practices" (Keogh 2019, 30) and "nonlinear understandings of technology" (Apperley and Parikka 2018, 352). Such an approach will help preserve and recognize contributions to technological history that are erased when we conceive of those technologies simply as *global*, disproportionately overemphasizing the contributions of formal developers in the global north while disproportionately underemphasizing the contributions of informal developers in the global south.

With regard to informal economic practices, Ramon Lobato's (2012) work *Shadow Economies of Cinema* sheds light on the nature of media distribution and its relationship to everyday life. Lobato reminds us that informal channels of media distribution – those that are "unmeasured, untaxed and unregulated," operating "within capitalist economies but beyond the purview of the state" (2012, 39-40) are the global norm rather than the exception (2012, 15). Lobato's work fundamentally claims that *media distribution* is not neutral but transmits values and ideology, frames the way media products are experienced by users and shapes media culture "in its own image" (2012, 15). We could think about Latin American clone consoles through this lens as well, how they transmit cultural values, enable local reception of so-called global game technologies, correspond to local cultural interests and frame the experience of video games for Latin American audiences.



As with film, the shadow economy is the global norm for video game distribution, rather than the exception. For years, game studies scholars have spoken of piracy as "endemic to the industry" (Kline, Dyer-Witheford and de Peuter 2003, 210, 215), and

there is a paradox at the core of game development: "on the one hand, alleged cloning – that is, copying – has been a cause of disputes and debates among game developers and publishers. On the other hand, imitation has always been considered a necessary and accepted part of game development" (Katzenbach, Herweg and van Roessel 2016, 840). This is true worldwide, but cloning and copying is especially crucial in consideration of the constraints faced by developers and localizers of technologies across the global south, who have frequently lacked access to technologies through the formal market or so-called global networks of software and hardware distribution. It is also important to remember that video game hardware and software are complex technologies produced by teams of people and consisting of myriad components: "for example, a game designer might copy parts of an existing game (e.g., a rule system or interface design) while adding new, original parts – or while taking these parts from yet another game (e.g., the graphics)," making it inaccurate to simply designate such a work a "copy" (Katzenbach, Herweg and Van Roessel 2016, 843). In the clone consoles examined below, we will see examples of how these consoles incorporated elements of existing game hardware, but also added new, original components and functions, blurring the lines between original and knockoff.



In fact, at the same time clone consoles were being developed across Latin America and the global south, early game hardware developers like Magnavox, Atari and Activision were engaged in continuous litigation over intellectual property rights within the United States. After Activision was found liable for patent infringement on a series of ball-and-paddle games in the 1985 case of Magnavox Co. v. Activision, Inc., Magnavox "went on to enforce its patents against virtually every game publisher whose game used a ball and paddle format of any kind" (Dannenberg and Davenport 2018, 90). Meanwhile, Atari's rivals were seeking to replicate the company's blueprint

for success – when Coleco's 1982 ColecoVision console and Mattel's 1983 Intellivision II console "offered external expansion modules that allowed their system to play [Atari] VCS cartridges," Atari sued, ultimately "settling for a royalty for each adapter unit and clone console sold" (Loguidice and Barton 2014, 44).

Given the lengths to which game hardware and software publishers were willing to go in their courtroom battles against copyright infringement in this era, developers of clone consoles in Latin America were protected, in a sense, by being off the map for so-called global game publishers. This is one reason cultural attitudes regarding piracy differ according to region – or in the words of Lawrence Liang, although "the anxiety and conflict over IP may be universal, the nature of the conflict gets configured differently as we move from the United States and Europe to parts of Asia, Latin America, and Africa" (2011, 59). Where there is no formal market, the informal market prevails. And for a long time, makers of video game software and hardware seemed to forget about players in Latin America and the global south, leaving them, quite literally, to their own devices.



In this context, it is important to think of so-called *piracy* in terms of what it does, and what it enables individuals who are otherwise excluded from global flows of technology and information to do. As Lawrence Liang (2011), Ramon Lobato (2012) and Mirko Tobias Schäfer (2011) have shown, phenomena like "informal infrastructure" (Liang 2011, 57) and "shadow economies" (Lobato 2012, 15) enable users to access the information and knowledge flows of contemporary global society, ultimately enabling them to participate in the customization, manipulation and reuse of media in ways that differ from the media industry's original intentions. Informal media production and distribution practices opened up a new world of technological access for video game players and creators in Latin America, ultimately offering them

benefits like those outlined by Manoel Ferreira (2017, 83), including knowledge of video games and developers, familiarity with game features, genres and mechanics, and participation in increasingly formalized video game competitions and clubs. Thus, critical attention to the role of piracy and informal technological production is crucial for understanding game platforms on a global level.

## Reconstructing Latin American Clone Console History

Piecing together the history of clone console development in Latin America presents numerous methodological challenges. Due to the semi-informal or informal nature of the enterprises that created these consoles, there are few to no companies still in existence with archives to draw from, and what little is currently available in terms of print or broadcast publicity and reporting is limited and difficult to source. Almost all available sources related to clone consoles in Latin America are published in Spanish and/or Portuguese, and many consoles can only be sourced through informal networks of fans and collectors without real guarantees as to the veracity of the data therein. All of this means that there remains much work to do in terms of the formalization of analytical and methodological frameworks for studying less-known and less frequently preserved technological artifacts like the clone consoles discussed below.



In this sense, as scholars of video game history we have much to learn from amateur aficionados and archivists. My research on clone consoles in Latin America for this article is indebted, more than anyone, to the regional video game fan and collector communities who have done more to preserve historic game hardware and software than any academic, state or private institution to date. This partially explains the preponderance of console references from Brazil in the present article, above and

beyond other major regional markets like Mexico and Argentina: today, Brazil is the country with the most active community of collectors of nationally produced game hardware and software. Alongside that community, a number of popular, journalistic and academic sources in Brazil and elsewhere in Latin America have begun to cover this unique facet of the history of technological development. Slowly but surely, attention is building at a national and regional level, but to date research on this topic has been limited and published almost exclusively in Spanish and Portuguese. One of the aims of the present article is to make that material available to an English-speaking audience, because a discussion of Latin American clone consoles has implications that can impact broader discussions in platform studies.

Research for this article began with identifying Latin American clone consoles and their verifiable characteristics, developing a taxonomical categorization system for tracing information about each console and then taking further steps to contact collectors, curators and scholars throughout Latin America to confirm as much data as possible. I began by seeking out and joining online communities of video game hardware and software collectors and fans in countries including Brazil, Mexico, Argentina and Colombia. Next, I combed collector websites, discussion groups, social networks and resale communities to compile a preliminary list of consoles from throughout the region, starting with the earliest identifiable examples. After compiling an initial set of just over 100 potentially identifiable Latin American clone consoles, I documented information about each and categorized them according to console name, country of origin, release date, platform and data source. This helped identify a number of consoles that had been listed more than once, some that had been marketed under multiple names, others that were manufactured abroad and imported to Latin America and still others about which no more information than a console name could be found, all of which I eliminated from the sample. When no

further information could be found but potential sources could be identified, I reached out to scholars, collectors and curators throughout Latin America to confirm data as thoroughly as possible in order to formulate the sample of 75 Latin American clone consoles used for this study. Ultimately, the consoles used as case studies were selected because they demonstrate key innovations by Latin American console developers, but also due to the fact that they were the examples with the most detailed and traceable histories.

## The Future in the Past: Snapshots of Latin American Clone Consoles

To illustrate the historical contributions of early Latin American clone consoles, I will proceed with a series of brief descriptions highlighting the innovations of several outstanding consoles created in the region between 1973 and 1994. These critical descriptions are a suggestion of the unplumbed depths of clone console history, pointing to possible directions for future research.



### The Pong Generation: The NESA Pong and the Telejogo

Certainly, the Telematch was not the only notable clone console of this era from Latin America. Not long after the release of the Atari PONG console in the US in June 1972, a Mexican version called the NESA Pong (figure 4) appeared on the market, produced by an engineer based out of Zamora, Michoacán named Morris Behar Pérez (Ayala 2013). Behar Pérez founded Novedades Electrónicas, S.A. (NESA; roughly meaning Electronic Novelties, Inc.), and designed, manufactured and distributed the NESA Pong not only in Mexico but throughout Latin America (Cervera and Quesnel 2015, 349). Enough NESA Pong consoles were produced to merit a design update, so two versions were circulated: one with a plastic casing with a black-and-white image, and another with a metallic casing that was played in color (Lara 2014, 24). Each one

featured a switch for changing between games, an on-off switch and a switch for alternating between one and two players, as well as dials used to move the paddles on screen when playing the three included games: *Pong* (ca. 1973), *Fútbol* (ca. 1973b) and *Frontenis* (ca. 1973) (Lara 2014, 24), the latter of which is a sport of Mexican origin.


Figure 4: NESA Pong console and gameplay. © Anwar Sánchez or (Del Bit a la Orquesta).

The NESA Pong had several notable custom features. As a measure of security and quality control, NESA marked the screws on the back of the casing with red paint to indicate their placement, so that if the user opened the console, it would be evident.

(NESA PONG 2015) Likewise, as a way of marking their presence in game hardware production, NESA stamped the circuit boards for the console with their company name and logo (figure 5). The inscription on the back of the console's casing also offers concise visual setting guidance: "to improve color, adjust the tint, brightness and contrast of your TV" (NESA PONG 2015). The NESA Pong became so popular in Mexico at the time, that the actual Atari PONG console was referred to as the NESA Pong as well, but a lack of visibility in TV and print advertising, along with ill-advised business dealings led to the demise of NESA only a few years after it was founded (National Video Game Museum 2016).

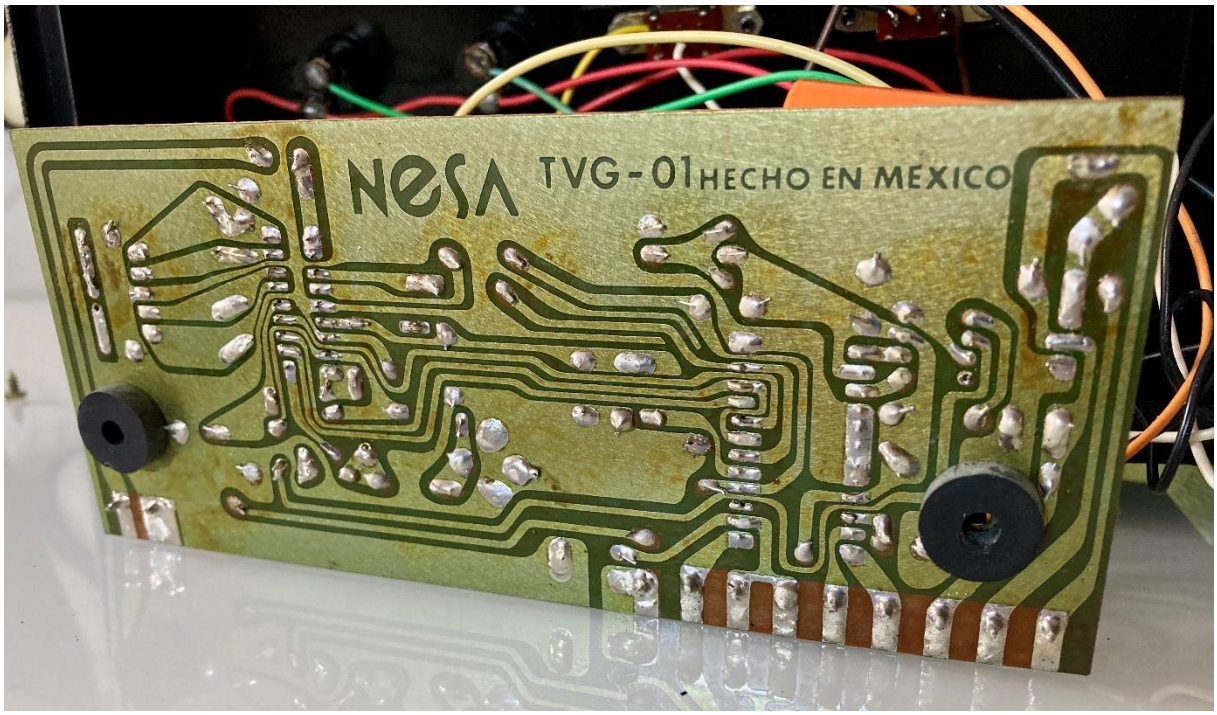



Figure 5: NESA Pong circuit board, stamped "Made in Mexico by N.E.S.A." © Anwar Sánchez or (Del Bit a la Orquesta).



The NESA Pong was by no means the only PONG clone to circulate in Latin America, much less globally. Jaroslav Švelch (2018, 34) notes the presence of PONG clones in Soviet Czechoslovakia around 1980, and Mandiberg (2021, 179) notes that games similar to Atari's PONG – some licensed, but most pirated – began to spring up

around the world soon after the release of the original. The Philco-Ford Telejogo (figure 6), a *licensed* PONG clone released in Brazil in 1977, was the result of US auto maker Ford's acquisition of home electronics firm Philco, who then began to produce car radios and air conditioners, as well as television sets and portable radios for the general market (Ford 2010). The Telejogo came hardwired with three games – *Paredão* (transl. Handball) (1977), *Tênis* (transl. Tennis) (1977), and *Futebol* (transl. Soccer) (1977) – while the 1978 follow-up Telejogo II console would feature a total of ten (Chiado 2013, 27, Ferreira 2017, 74). For their players, access to these consoles and the many other Latin American PONG clones listed in the appendix meant entry into the global informational economy (Liang 2011, 57), while the developers of these consoles were laying the groundwork and creating the commercial networks for sustained production and distribution of game hardware and software on local, national and regional levels.




Figure 6: Philco-Ford Telejogo console, with incorporated control knobs and switches to select among games and gameplay options. © Ladmir@alterdata.com.br.

**Colecovision Curiosities: The CCE Supergame VG-2800 and the Onyx Junior**

CCE (Comércio de Componentes Eletrônicos) was founded in 1964 in São Paulo (Chiado 2013, 188), which meant that by 1983, the firm had ample experience with electronics hardware when they released the Supergame VG-2800 (figure 7), a rare Latin American clone of the US-made Coleco Gemini console, itself a clone of the Atari VCS. In the preceding years, CCE had established itself as a manufacturer of Atari cartridges in Brazil, and in addition to *O Carteiro* (transl. The Postman) (1983) which was packaged with the console, they produced eight additional game cartridges to accompany the VG-2800 (Chiado 2013, 190, 193): *A Dança dos Pratos* (transl. Dancing Plate) (1983); *Bobby Vai Para Casa* (transl. Bobby Is Going Home) (1983); *Abre-te, Sésamo!* (transl. Open, Sesame!) (1983); *O Monstro Marinho* (transl. Sea Monster) (1983); *Missão 3000 A.D.* (transl. Mission 3000 A.D.) (1983); *O Túnel Espacial* (transl. Space Tunnel) (1983); *Tanque Fantasma* (transl. Phantom Tank) (1983); and *O Esquil* (transl. Squirrel) (1983). CCE responded to the low level of interest in paddle games among Brazilian players by foregoing the Atari paddle controllers and games altogether, opting for a model similar to the Atari joystick, but with a larger, yellow fire button (Chiado 2013, 198). In Brazil, the VG-2800 gained advantage over the official Polyvox Atari clone largely due to being more affordable, leading CCE to release an even cheaper console, the VG 3000, just a year later (Falcão 2017). For the update, both controllers (the joystick and the fire button) were hardwired to the console, with a DB9 connector available for an optional controller and only two buttons on the console itself: Start/Reset and On/Off (GamePlayerSpecial 2012). The Supergame shows how CCE was able to leverage its experience and preparedness to successfully modify and localize Atari- and Coleco-compatible hardware to Brazilian players.




Figure 7: CCE Supergame VG-2800 console, advertisement. © Phillip Penix-Tadsen.




Figure 8: A military-themed advertisement for the Onyx Junior announcing that "the highest rank in video games has arrived." © Phillip Penix-Tadsen.

While Colecovision clones in Latin America were rare relative to Atari and PONG clones, the Supergame VG-2800 was not alone. Another Brazilian firm, Microdigital, released a Colecovision clone called the Onyx in 1983. However, after the firm found the Onyx to be at a disadvantage in local markets due to the high memory demands and prices of the Colecovision cartridges, they decided to pivot and released an Atari-compatible console, the Onyx Junior, a year later in 1984 (Chiado 2013, 106). Given that the Onyx Junior was released in the context of a military dictatorship that had been in power for two decades in Brazil, the military-themed console and emotionally charged advertising campaign behind it are particularly ominous (figure 8). In terms of the history of console development, the Onyx Junior had one particularly notable innovation, enabled by Microdigital's choice to use an MOS 650 2C processor instead of the 6507 processor used in Atari consoles (TomBrazil 2005): a pause button, one of the earliest in the history of home game consoles (Ferreira 2017, 77). The innovations and adaptations that made Colecovision clones like the Onyx and the CCE Supergame VG-2800 show how local hardware producers went above and beyond the consoles they were supposedly copying in order to make products that were more advanced, more functional and more appealing to Brazilian players than anything the mainstream global market was producing.



**The Atari Explosion: Dismac VJ9000 and Dynacom Dynavision**

The release of the Atari VCS / 2600 home console brought about another wave of clone console development across Latin America. The Atari-compatible Dismac VJ 9000 was released in 1984, quickly building its developer a reputation for making the most refined consoles of its era (Falcão 2017, figure 8). To produce the VJ9000, the veteran Brazilian computer and calculator manufacturer Dismac decided to take advantage of its existing facilities in the Manaus duty-free zone, refitting existing molds in order to manufacture some 10,000 consoles (Chiado 2013, 54). Dismac

circulated multiple versions of the physical console, including a rare variation that used the Activision logo on its casing (Familia Atari 2021, figure 9). Another innovation that enabled Dismac to achieve success with the Brazilian audience was its translation of game titles – "*Pitfall!* Became '*Pantanal*,' *Kaboom* became '*T.N.T.*,' *Freeway* became '*BR 101*' and so forth" (Chiado 2013, 54) – an early, if modest, manifestation of game localization. A year after the release of the VJ 9000, Dismac launched the VJ 8900, which, like the CCE Supergame VG-2800, did away with the paddle controllers and games in favor of a more simplistic interface and two joystick-style controllers (Chiado 2013, 200). These changes show how the creators of consoles not only added new features, but also removed those that were superfluous to their purposes or audience.




Figure 9: A rare edition of the Dismac VJ 8900 console emblazoned with Activision logos. © Phillip Penix-Tadsen.




Figure 10: Dynacom Dynavision advertisement highlighting its advanced input devices and other features. © Phillip Penix-Tadsen.

A year earlier in 1983, Brazilian company Dynacom had released another notable Atari-compatible console, the Dynavision (figure 10). Like other clone console producers, Dynavision had previously made and distributed cartridges for the Atari (Chiado 2013, 154, Falcão, 2017), and they drew on this experience in order to make improvements to the system's hardware and software. The Dynavision offered upgrades including anatomical joysticks with suction cups on the base for improved performance, joystick cable inputs on the front of the console rather than the rear, and a 6502 processor identical to the one used in the Apple II personal computer that could store up to 64KB of data, much more than was possible with the Atari VCS (Chiado 2013, 156, Ferreira 2017, 76). It also featured an alphanumeric keyboard for programming and a novel *mute* function to control the television volume when the console was disconnected or cartridges were removed (Chiado 2013, 47, 156). Dismac and Dynavision were breakthrough firms in the history of technological development in Brazil, and the modifications they made to the consoles they released are a demonstration of their awareness of local needs and desires, their capacity to build on a foundation of experience producing electronic hardware and game software and their contributions to the ways South American users in particular experienced the Atari platform.



**A Hybrid Console: The Gradiente Phantom**

The final clone I wish to discuss was a case study in console hybridity, incorporating the casing of an Atari 7800, running NES cartridges and using a Sega Mega Drive-style controller. Indeed, the Gradiente Phantom is a sort of technological zombie, having risen from the dead after Gradiente made a last-minute pivot from its planned release of an Atari 7800-compatible console to an NES-compatible model, but chose to stick with the original black plastic casing for its 1989 release (Phantom System 2021, figure 11).




Figure 11: Gradiente Phantom console, controller and *Super Irmãos* (1993) cartridge. © Matheus Magno (@bagnobigar).

While it is compatible with US-format 72-pin NES cartridges, its controllers use DB-9 connections, the same style used in the MSX computer and Atari 2600 (Ferreira 2017, 81). And, in order to port the Sega controller to play NES games, the C button became Start, and the Start button became Select (Gogoni 2021). Gradiente had seen audience interest in Atari games decline after Dynacom released the NES-compatible Dynavision 2 and, in a conscious push to create a *Nintendinho*-compatible alternative to Brazilian firm Tectoy's Sega-compatible dominance in the Brazilian market, pivoted to the NES platform (Chiado 2013, 293). This chain of events was not only the result of the crash of the video game market in the US around the same time, it was an

opportunity for Gradiente to dodge that crash by responding proactively (The Enemy 2020). And so they did, creating a console that was less expensive, more lightweight, more energy-efficient and cheaper to manufacture than the original.

It wasn't long before Nintendo itself took note of the success of the Phantom in Brazil. The NES had quickly come to be cloned worldwide, and unlicensed reproductions of the console rapidly spread throughout Latin America and elsewhere, as they were cheaper and more adaptable, and frequently sold alongside multi-game cartridges (Cervera and Quesnel 2015, 349). In the late 1980s or early 1990s, Stefano Arnhold, co-founder of Tectoy and representative of Sega in Brazil, tried to court Nintendo with the hopes of bolstering Tectoy's market share – which was taking a hit due to the availability of cheaper, pirated NES-compatible software – but the Japanese game giant declined (A História 2020). A few years afterward, Nintendo approached Gradiente to produce the Super Nintendo console in Brazil, but only under the condition that they cease selling the Phantom System and all unlicensed games (The Enemy 2020). Gradiente jumped at the opportunity to officially represent Nintendo on the Brazilian market, but because they were reluctant to let go of their booming business publishing unlicensed games for Nintendo-compatible consoles, they created a shell company called FalconSoft and continued producing Nintendo games, but swapped out packaging, labels and at times in-game assets. This is the context from which *Super Irmãos* (1993) emerged, (The Enemy 2020, figure 12) a bootleg version of *Super Mario Bros.* (1985) that was popular among Brazilian players at the time, and is a sought-after collector's piece today.




Figure 12: *Super Irmãos* instruction manual. © Phillip Penix-Tadsen.

## Conclusion: The Impact of Latin American Clone Consoles, 1973-1994

In thinking of the historical impact of clone consoles in Latin America, it is useful to think of piracy's role in "digital game ecology," an approach that highlights unevenness in access to gaming technologies, but "also moves beyond the dichotomy of have, or have not, to explore and examine a variety of different, but unequal practices, and consider what is at stake in differing forms of inclusion" (Apperley 2009, 15). In spite of many obstacles, game consoles began to arrive to homes and cybercafes throughout Latin America around the same time as their

release in the United States (Schleiner 2020, 51-52). In some cases, this occurred when travelers brought back consoles in their luggage, but on a larger scale, this importation occurred first through channels of contraband in "duty-free zones," for example the Brazilian city of Manaus (Chiado 2013, 24, Falcão 2017). Local companies quickly took note of public interest in video games, and they began to produce consoles that were more affordable and more widely available than rare imports. By 1983, Brazilian manufacturer Polyvox was producing more than 1,000 units of the official-market national Atari console each day (Chiado 2013, 24).

The practitioners of piracy who founded Latin America's video game industries went from informality to formality using a toolkit based on reverse engineering, establishment of technological development networks, knowledge-sharing and collective generation of a critical mass of experience. In many ways, this history parallels the history of Korean console makers described by Dongwon Jo (2020): the first bootleggers of video games acquired the technical skills through years of experience manufacturing and repairing radios, audio systems and televisions, giving them the skills to tinker with the inner workings of the wave of new electronic imports emerging from the US and Japan. This type of reverse engineering has a long history as a legally accepted practice (Samuelson and Scotchmer 2002, 1577). It also responds to particular factors in each locale. As mentioned earlier, in Brazil this included the Computer Market Reserve, a legal framework that prohibited national businesses from importing or distributing the Atari 2600 and other mainstream consoles, leading Brazilian hardware manufacturers to decide to disassemble and analyze the consoles in order to manufacture their own "Atari-compatible" consoles using a mix of local and imported components (Ferreira 2017, 74). Joseph Maghrabi, creator of the first Atari console in Brazil, explained this process in a 1983 interview:

> "We took apart the Atari and analyzed how it worked. We had some of the components made here, and the chips would be made by an American company. Our policy was the same as with the Japanese: believe in nothing, copy everything. If it worked for them, why not for us?" (Chiado 2013, 47)

But the so-called cloning process required more than just tinkering, and it produced more than just profits. As Jo (2020) notes, copying game hardware "entailed a variety of infrastructural factors: the existence of a parts market, urban manufacturing sites, affordable access to ICs and other components, as well as connection to traders, technicians, and their networks," factors which "combined to operate as a pirate infrastructure that facilitated the copying of circuit boards, assembling of game machines, and modifying of arcade hardware and software." Throughout Latin America, companies cloning game consoles and other game hardware created supply chains that laid the groundwork for the development of mature national game industries. As Héctor Óscar González Seguí explains:



> "In nearly all the major cities in Mexico, arcade game manufacturers began to spring up, and they would assemble the games with monitors, cabinets with buttons and joysticks, as well as circuits (motherboards); likewise, wholesalers on refurbished parts and supplies (joysticks, screens, etc.). Commercial game chains, which had set up headquarters in Mexico City, Guadalajara, Monterrey and Puebla, expanded all over the country. They set up games on commission along some very extensive routes, for example the one that stretched from Guadalajara to Lázaro Cárdenas, in Michoacán." (González Seguí 2000, 106)

This infrastructure was necessary for the growth of national video game industries throughout Latin America, and its history deserves to be documented in greater detail.

Clone consoles from Latin America also reflect the ways local creators must adapt imported technologies to make them functional for local users, frequently leading to

innovations and improvements on the originals. Unlike the highly programmable PC, the typical game console is designed to be "as tightly and securely protected as possible against its users' intrusions" (Sihvonen 2011, 107). Console copying also responded to local situations in a number of significant ways, for example by solving the problem of Atari consoles' incompatibility with Brazilian televisions through the creation of the Polyvox console, with the official Atari console for the Brazilian market popularly referred to there as the "Atari do Atari," or "Atari's Atari" (Brito 2016, 19-20). Myriad unlicensed clones followed a different path, but were similarly innovative. As Jo (2020) explains, the process of copying can be understood not so much as an attempt to precisely imitate an original design, but instead as "a set of improvisational practices that included the creation of alternate artifacts composed of materials available at hand," and this is plainly visible in the ways Latin American clone consoles incorporate unconventional and pre-existing components. One notable case is the Magiclick Teleclick, a 1977 clone-compatible console from Argentina, which featured controllers made from surplus plastic calculator shells. Other examples of improvisations and innovations from early Latin American console developers abound: the Atari-compatible 1992 Dynacom MegaBoy from Brazil combined console and controller in a single unit and transmitted the audio-video signal wirelessly to the television, while the ProSystem-8, an NES-compatible console released by NES cartridge manufacture Chips do Brasil in 1994, featured controllers with a built-in "turbo" and "slow motion" function (Falcão 2017). Without a doubt, these examples show that clones are not really *clones* after all, and that they make enormous historical contributions to platform studies, the history of regional technological development and the history of global game culture.



The history of video game hardware and software is full of copycats: Noah Bushnell created *PONG* by adapting Ralph Baer's "Brown Box" prototype ping-pong game for

the Magnavox Odyssey, which itself was created following the design *Tennis for Two* (1958) (Mandiberg 2021, 342-347). And as Nicoll has argued, a pirated platform "should not be omitted from narratives of successful video games simply because the cultural practices it supported do not align with a specific set of copyright discourses" (2019). This is why we must recognize the due place of creators of video game hardware and software in Latin America and elsewhere in the global south in the history of game development and global game culture. The pause button. The mute function. A fast forward/rewind control. Wireless capability. Portability. Who could say which console was the first to incorporate any of these innovations if our knowledge of video game platforms and hardware is narrowly focused on the products of a handful of companies from a few countries in the global north? The dozens of consoles created in the earliest years of video game hardware development in Latin America offer ample evidence of their creators' contributions. Greater attention to examples like theirs will enrich our understanding of global game history and game culture, and help reimagine and diversify the field of platform studies.



## References

*A Dança dos Pratos*, 1983. [video game] (Supergame VG-2800) Comércio de Componentes Eletrônicos, Comércio de Componentes Eletrônicos.

*Abre-te, Sésamo!*, 1983. [video game] (Supergame VG-2800) Comércio de Componentes Eletrônicos, Comércio de Componentes Eletrônicos.

Altice, N., 2015. *I am error: The Nintendo Family Computer / Entertainment System platform*. Cambridge: MIT Press.

Anable, A., 2018. Platform studies. *Feminist Media Histories*, 4(2), 135-140. DOI: https://doi.org/10.1525/fmh.2018.4.2.135.

Apperley, T., 2009. *Gaming rhythms: Play and counterplay from the situated to the global*. Amsterdam: Institute of Network Cultures.

Apperley, T. and Parikka, J., 2018. Platform studies' epistemic threshold. *Games and Culture*, 13(4), 349-369. DOI: https://doi.org/10.1177/1555412015616509.

Ayala, F., 2013. TagDF concluye con cierre de lujo. *Publimetro*, [blog] 4 July. Available at https://www.publimetro.com.mx/mx/tecnologia/2013/07/05/tagdf-concluye-cierre-lujo.html, accessed 23 May 2024.

Bar, F., Weber, M. S. and Pisani, F. 2016. Mobile technology appropriation in a distant mirror: Baroquization, creolization, and cannibalism. *New Media & Society*, 18(4), 617-636. DOI: https://doi.org/10.1177/1461444816629474.

*The Bionic Woman*, 1976. [television series], Universal Television, American Broadcast Company.

*Bobby Vai Para Casa*, 1983. [video game] (Supergame VG-2800) Comércio de Componentes Eletrônicos, Comércio de Componentes Eletrônicos.

BootlegGames Wiki, 2021. Phantom System. *BootlegGames Wiki*, [wiki]. Available at https://bootleggames.fandom.com/wiki/Phantom_System, accessed 28 May 2024.

Burgess, J., 2021. Platform studies. In: Cunningham, S. and Craig, D., eds. *Creator*

*Culture: An Introduction to Global Social Media Entertainment*. New York: New York University Press, 21-38.

Carrocultura, 2010. Ford, uma fábrica de TVs, rádios e vídeo-games! *Carrocultura*, [blog] 8 November. Available at https://carrocultura.wordpress.com/2010/11/08/ford-uma-fabrica-de-tvs-radios--e-video-games/, accessed 28 May 2024.

GamePlayerSpecial, 2012. CCE Supergame VG 3000 – Atari Clone. *GamePlayerSpecial* [blog], 10 July. Available at https://gameplayerspecial.wordpress.com/2012/07/10/soon-supegame-vg-3000/, accessed 19 June 2024.

Cervera, H. and Quesnel, J., 2015. Mexico. In: Wolf, M. J. P., ed. *Video games around the world*. Cambridge: MIT Press, 345-357.



Chorgox, 2020. Consola del mes: Telematch de Panoramic (197x). *r/JuegoRetroLatino*, [subreddit]. 10 May 2020. Available at https://www.reddit.com/r/JuegoRetroLatino/comments/gh7poh/consola_del_mes_telematch_de_panoramic_197x/, accessed 23 May 2024.

Compuclásico, 2021. Familia Atari. *Compuclásico: Cambalache digital*, [blog]. Available at http://www.compuclasico.com/site/museo/atarivg, accessed 23 May 2024.

Coto, A., 2021. *Cuando no fuimos Japón*, [Twitter] 23 February 2021. Available at https://x.com/agustcot/status/1364203307036774401, accessed 23 May 2024.

da Costa Marques, I., 2005. Cloning computers: From rights of possession to rights of

creation. *Science as Culture*, 14(2), 139-160. DOI: https://doi.org/10.1080/09505430500110887.

da Costa Marques, I., 2015. Brazil's Computer Market Reserve: Democracy, authoritarianism, and ruptures. *IEEE Annals of the History of Computing*, 37(4), 64-75. DOI: https://doi.org/10.1109/MAHC.2015.53.

de Caso, G., 2011. Breve repaso histórico de la computación hogareña en la Argentina. *Revista Iberoamericana de Ciencia, Tecnología y Sociedad*, 6(18), 89-104. Available at https://www.revistacts.net/contenido/numero-18/breve-repaso-historico-de-la-computacion-hogarena-en-la-argentina/, accessed 23 May 2024.

de Moura Brito, J. N., 2016. *A Inserção de Brasil e Estados Unidos no mercado mundial de games: uma reflexão acerca da relação entre economia criativa, sociedade informacional e estado empreendedor*. [Bachelor's thesis], Dourados: Universidade Federal da Grande Dourados.



Dannenberg, R. and Davenport, J., 2018. Top ten video game cases (US): How video game litigation in the US has evolved since the advent of *Pong*. *Interactive Entertainment Law Review*, 1(2), 89-102. DOI: https://doi.org/10.4337/ielr.2018.02.02.

Dirlik, A., 2007. Global South: Predicament and promise. *The Global South*, 1(1), 12-23. DOI: https://doi.org/10.2979/gso.2007.1.1.12.

Donovan, T., 2010. *Replay: The history of video games*. Lewes: Yellow Ant.

Eglash, R., 2004. Appropriating technology: An introduction. In: Eglash, R., Croissant, J.

L, Di Chiro, G. and Fouché, R., eds. *Appropriating technology: Vernacular science and social power*. Minneapolis: University of Minnesota Press, vii-xxi.

Falcão, P., 2017. Ataque dos clones: os grandes consoles brasileiros. *Red Bull Brasil*, [blog] 30 March. Available at https://www.redbull.com/br-pt/ataque-dos-clones-os-grandes-consoles-brasileiros-paralelos, accessed 23 May 2024.

Ferreira, M., 2017. A guerra dos clones: transgressão e criatividade na aurora dos video games no Brasil. *Sessões do Imaginário*, 22(38), 72-84. DOI: https://doi.org/10.15448/1980-3710.2017.2.29806.

Frasca, G., 2015. Uruguay. In: Wolf, M. J. P., ed. *Video games around the world*. Cambridge: MIT Press, 609-612.



Frasca, G., 2021. Prólogo. In: Wong, L., ed. *América Latina juega: Historias del videojuego latinoamericano*. Bollullos de la Mitación: Héroes de Papel, 10-15.

*Frontenis*, ca. 1973. [video game] (NESA Pong) Novedades Electrónicas, Novedades Electrónicas.

*Fútbol*, ca. 1973a. [video game] (Telematch J5) Panoramic, Panoramic.

*Fútbol*, ca. 1973b. [video game] (NESA Pong) Novedades Electrónicas, Novedades Electrónicas.

*Futebol*, 1977. [video game] (Telejogo) Philco-Ford, Philco-Ford.

Chiado, G. and Vinicius, M., 2013. *1983 + 1984: E Mais! O Livro digital.* Self-published.

Gogoni, R., 2021. A história dos video games no Brasil, Parte 2. *Meio Bit*. Available at https://meiobit.com/439561/historia-videogames-no-brasil-parte-2/, accessed 29 May 2024.

González Seguí, H. Ó., 2000. Veinticinco años de videojuegos en México: Las mercancías tecnoculturales y la globalización económica. *Comunicación y Sociedad*, 38, 103-127. Available at http://link.gale.com/apps/doc/A128671420/AONE?u=udel_main&sid=googleScholar&xid=eddfde7e, accessed 29 May 2024.

Hård, M. and Jamison, A., 2005. *Hubris and hybrids: A cultural history of technology and science*. London: Routledge.



Jo, D., 2020. "Bursting circuit boards": Infrastructures and technical practices of copying in early Korean video game industry. *Game Studies*, 20(2). Available at https://gamestudies.org/2002/articles/jo, accessed 28 May 2024.

Katzenbach, C., Herweg, S. and van Roessel, L., 2016. Copies, clones, and genre building: discourses on imitation and innovation in digital games. *International Journal of Communication*, 10. Available at https://ijoc.org/index.php/ijoc/article/view/4802, accessed 28 May 2024.

Keogh, B., 2019. From aggressively formalised to intensely in/formalised: accounting for a wider range of video game development practices. *Creative Industries Journal*, 12(1), 14-33. DOI: https://doi.org/10.1080/17510694.2018.1532760.

Kline, S., Dyer-Witheford, N. and de Peuter, G., 2003. *Digital play: the interaction of technology, culture, and* marketing. Montreal: McGill-Queens University Press.

Lara, H., 2014. Retrogaming: PONG. *The Legacy Magazine*, 1(1), 21-28. Available at https://issuu.com/journey6432/docs/nov-dic-2, accessed 29 May 2024.

Larson, I., 2022. The bootleg connection: Micro genius and the transnational circulation of early clone consoles. *ROMchip*, 4(1). Available at https://romchip.org/index.php/romchip-journal/article/view/143, accessed 28 May 2024.

Liang, L., 2011. Piracy, creativity, and infrastructure: Rethinking access to culture. In: Subramanian, R. and Katz, E., eds. *The global flow of information: Legal, social, and cultural perspectives.* New York: New York University Press, 54-89.



Lobato, R., 2012. *Shadow economies of cinema: Mapping informal film distribution.* London: Bloomsbury.

Loguidice, B. and Barton, M., 2014. *Vintage game consoles: an inside look at Apple, Atari, Commodore, Nintendo, and the greatest gaming platforms of all time.* Waltham: Focal Press.

Mandiberg, S., 2021. Video games have never been global: Resituating video game localization history. In: Swalwell, M., ed. *Game history and the local.* London: Palgrave Macmillan, 177-198.

Mignolo, W., 2011. Introduction: The Global South and world dis/order. *Journal of*

*Anthropological Research*, 67(2), 165-188. DOI: https://doi.org/10.2979/globalsouth.5.1.1.

*Missão 3000 A.D.*, 1983. [video game] (Supergame VG-2800) Comércio de Componentes Eletrônicos, Comércio de Componentes Eletrônicos.

Montfort, N. and Bogost, I., 2009. *Racing the beam: The Atari Video Computer System*. Cambridge: MIT Press.

Murray, S., 2017. *On video games: the visual politics of race, gender and space*. London: Bloomsbury.

National Video Game Museum, 2016. *Shortly after Atari's* Pong *arcade game wowed American gamers, Mexican engineer Morris Behar designed, manufactured and distributed his own version of the game all across Latin America*, [Facebook] 5 February 2016. Available at https://www.facebook.com/photo/?fbid=550563775112984, accessed 28 May 2024.

Nicoll, B., 2019. *Minor platforms in video game history*. Amsterdam: Amsterdam University Press.

*O Carteiro*, 1983. [video game] (Supergame VG-2800) Comércio de Componentes Eletrônicos, Comércio de Componentes Eletrônicos.

*O Esquilo,* 1983. [video game] (Supergame VG-2800) Comércio de Componentes Eletrônicos, Comércio de Componentes Eletrônicos.

*O Monstro Marinho,* 1983. [video game] (Supergame VG-2800) Comércio de Componentes Eletrônicos, Comércio de Componentes Eletrônicos.

*O Túnel Espacial,* 1983. [video game] (Supergame VG-2800) Comércio de Componentes Eletrônicos, Comércio de Componentes Eletrônicos.

*Paredão*, 1977. [video game] (Telejogo) Philco-Ford, Philco-Ford.

Peluso, C., 2020. *#QuedateEnCasa #CoronavirusEnArgentina #Cuarentena Año 1977 La BISABUELA de la PLAY Te inculcaban pasar de grado para tenerla y en la gráfica te la vendía Gachi Ferrari @PEDRO_MINGO @Centrojas @viejotaura @jorgevi53526461 @NorchiAlbo*, [X] 30 March 2020. Available at https://x.com/carguipel/status/1244482783881433089, accessed 28 May 2024.



*Pong*, 1972. [video game] (Arcade) Atari, Atari.

*Pong*, ca. 1973. [video game] (NESA Pong) Novedades Electrónicas, Novedades Electrónicas.

Portnow, J., Protasio, A. and Donaldson, K., 2013. Brazil: Tomorrow's market. In: Huntemann, N. B. and Aslinger, B., eds. *Gaming globally: Production, play and place*. London: Palgrave Macmillan, 75-78.

Prieto, C. and Katherine, L., 2014. *Videojuegos en Colombia*. [Bachelor's thesis], Bogotá: Universidad de los Andes.

Renan Barzilay, A., 2019. The technologies of discrimination: How platforms cultivate

gender inequality. *The Law & Ethics of Human Rights*, 13(2), 179-202. DOI: https://doi.org/10.1515/lehr-2019-2006.

Samuelson, P. and Scotchmer, S., 2002. The law and economics of reverse engineering. *The Yale Law Journal*, 111(7), 1575-1663. Available at https://www.yalelawjournal.org/article/the-law-and-economics-of-reverse-engineering, accessed 28 May 2024.

Saucedo, R., 2021a. Personal correspondence. 27 September 2021.

Saucedo, R., 2021b. Pongs Argentinos. *Compuclásico: Cambalache digital*. Available at http://www.compuclasico.com/site/made_in_argentina/telematch, accessed 28 May 2024.



Schäfer, M. T., 2011. *Bastard culture! How user participation transforms cultural production.* Amsterdam: Amsterdam University Press.

Schleiner, A. M., 2020. *Transnational play: Piracy, urban art, and mobile games.* Amsterdam: Amsterdam University Press.

Sihvonen, T., 2011. *Players unleashed! Modding* The Sims *and the culture of gaming.* Amsterdam: Amsterdam University Press.

*The Six Million Dollar Man*, 1973. [television series] Universal Television, American Broadcast Company.

*Soccer*, 1973. [video game] (Arcade) Taito, Taito.

*Super Mario Bros.*, 1985. [video game] (Nintendo Entertainment System) Nintendo R&D4, Nintendo.

Suominen, J., 2017. How to present the history of digital games: Enthusiast, emancipatory, genealogical, and pathological approaches. *Games and Culture*, 12(6), 544-562. DOI: https://doi.org/10.1177/1555412016653341.

*Super Irmãos*, 1993. [video game] (Gradiente Phantom) FalconSoft, FalconSoft.

*Super soccer*, 1973. [video game] (Arcade) Allied Leisure Industries, Allied Leisure Industries.

Švelch, J., 2018. *Gaming the Iron Curtain: how teenagers and amateurs in communist Czechoslovakia claimed the medium of computer games.* Cambridge: MIT Press.



Swalwell, M., 2021. Introduction: Game history and the local." In: Swalwell, M., ed. *Game history and the local*. London: Palgrave Macmillan.

*Tanque Fantasma*, 1983. [video game] (Supergame VG-2800) Comércio de Componentes Eletrônicos, Comércio de Componentes Eletrônicos.

Panoramic, ca. 1973. Telematch instruction card. [instruction card], ca. 1973. Argentina: Panoramic.

*Tênis*, 1977. [video game] (Telejogo) Philco-Ford, Philco-Ford.

*Tennis for two*, 1958. [video game] (Analog computer) William Higinbotham, William

Higinbotham.

The Enemy, 2020. *A História do Phantom System: O Brasil surpreende a Nintendo | Destravado Ep 2*, [YouTube video] (19 January). Available at https://youtu.be/1w-OBRXmQok, accessed 28 May 2024.

Tinn, H., 2011. From DIY computers to illegal copies: The controversy over tinkering with microcomputers in Taiwan, 1980–1984. *IEEE Annals of the History of Computing*, 33(2), 75-88. DOI: https://doi.org/10.1109/MAHC.2011.38.

TomBrazil, 2005. #67318; The Onyx Jr. Console from Microdigital - a 2600 with pause. *Atari Age*, [forum] 3 April 2005. Available at https://forums.atariage.com/topic/67318-the-onyx-jr-console-from-microdigital-a-2600-with-pause/, accessed 28 May 2024.



Trott, V. A., 2023. *Feminist activism and platform politics.* London: Routledge.

Weiss, B., 2007. *Classic home video games, 1972-1984: A complete reference guide.* Jefferson: McFarland & Company.

Winter, D., 1996. Panoramic Telematch - the Argentinian Odyssey clone. *Pong Story*, [blog]. Available at https://www.pong-story.com/panoramic_telematch.htm, accessed 28 May 2024.

Winter, D., 2008. System profile: The Magnavox Odyssey. In: Wolf, M. J. P., ed. *The video game explosion: A history from PONG to PlayStation and beyond*. Santa Barbara: Greenwood Press.

XTOA3, 2015. *NESA PONG 197(?) consola Mexicana, modelos y diferencias*, [YouTube video] (24 February). Available at https://youtu.be/giOOymm8-Yw, accessed 28 May 2024.

## Appendix: Latin American Clone Consoles, 1973-1994

| Console Name | Country of Origin | Release Date[vii] |
|---|---|---|
| **Magnavox Odyssey platform** | | |
| Panoramic Telematch J5 | Argentina | 1973 |
| Telebolito | Colombia | 1975 |
| Hiroshima Videojuel | Argentina | 1975 |
| Panoramic Telematch J6 | Argentina | 1977 |
| Panoramic Telematch Junior | Argentina | 1977 |
| **PONG platform** | | |
| NESA Pong | Mexico | 1973 |
| Juker Telegol | Argentina | 1975 |
| Kolor 78 | Argentina | 1976 |
| Teyboll Automático | Argentina | 1976 |
| GTE Tele Pong A-100 | Mexico | 1976 |
| Juker Telegol 2 | Argentina | 1977 |
| Magiclick Teleclick | Argentina | 1977 |
| Noblex Micro 14 | Argentina | 1977 |
| Radio Serra -- Talent Ranser TV-Pong | Argentina | 1977 |
| Evadin TVG 102-4 | Brazil | 1977 |
| Hobbytron Videoalvo | Brazil | 1977 |
| Philco Ford Telejogo | Brazil | 1977 |
| Superkit TV Jogo 3 | Brazil | 1977 |
| Poc Poc 2007 | Mexico | 1977 |
| Eletron TV Jogo | Brazil | 1978 |
| Eletronic do Brasil TV Bol | Brazil | 1978 |
| Hobbytron Videorama | Brazil | 1978 |
| Philco Ford Telejogo II | Brazil | 1978 |
| Eletron TV Jogo 4 | Brazil | 1979 |
| Teletronix Telegame 4002 | Brazil | 1979 |

| | | |
|---|---|---|
| Gründig / Teleclick Color | Argentina | 1980 |

| **Atari VCS platform** | | |
|---|---|---|
| Activision Family Game | Argentina | 1977 |
| Brasar Brasvision | Argentina | 1977 |
| Dynacom Jr. | Argentina | 1977 |
| Dynacom Vanevision | Argentina | 1977 |
| Froggy Junior | Argentina | 1977 |
| Atari Eletrônica CX-2600 | Brazil | 1980 |
| Edu Juegos / Edu Games 2600 | Argentina | 1982 |
| Bit Top Game | Brazil | 1982 |
| Brasil Ltda Splice Vision | Brazil | 1982 |
| CCE Supergame VG-2800 | Brazil | 1983 |
| Dynacom Dynavision | Brazil | 1983 |
| Microdigital Onyx | Brazil | 1983 |
| Sayfi Dactari | Brazil | 1983 |
| Microdigital Onyx Junior | Brazil | 1984 |
| CCE Supergame VG-3000 | Brazil | 1985 |
| Dismac Video Game VJ8900 | Brazil | 1985 |
| ACH Screen Search 2600 | Argentina | 1986 |
| Artkaris 2600 | Argentina | 1986 |
| Clevergame | Argentina | 1986 |
| Dactar II | Brazil | 1986 |
| Milmar Memory Game | Brazil | 1986 |
| Panavox TV Game | Brazil | 1986 |
| Polyvox Atari 2600S | Brazil | 1986 |
| Funfair 2600 | Mexico | 1986 |
| Apple Vision | Brazil | 1987 |
| Malitron TV Jogo 10 | Brazil | 1988 |
| Dynacom Dynavision II | Brazil | 1989 |
| Dynacom MegaBoy | Brazil | 1992 |

| **Sega Master System platform** | | |
|---|---|---|
| Tectoy Master System | Brazil | 1989 |
| Dynacom Megavision | Brazil | 1990 |
| Tectoy Master System 2 | Brazil | 1991 |
| Tectoy Master System Girl | Brazil | 1994 |
| Tectoy Master System Super Compact | Brazil | 1994 |

| **Nintendo Famicom / NES platform** | | |
|---|---|---|
| Dismac Bit System | Brazil | 1989 |
| Gradiente Phantom | Brazil | 1989 |
| CCE Top Game VG 9000 | Brazil | 1990 |
| IBTC Super Charger | Brazil | 1990 |
| Milmar Hi-Top Game | Brazil | 1990 |
| CCE Turbo Game | Brazil | 1991 |
| Nichi-Man | Colombia | 1992 |
| Bit Video Racer | Argentina | 1992 |
| HBL Tech Family Super 8 Bitgame | Argentina | 1992 |
| Geniecom | Brazil | 1992 |
| Electrolab Family Game | Argentina | 1993 |
| Hot Boy Entertainment Home Computer | Brazil | 1993 |
| Dynacom HandyVision | Brazil | 1993 |
| Chips do Brasil ProSystem-8 | Brazil | 1994 |
| Milmar Top System | Brazil | 1994 |
| Super Pro System 16 | Brazil | 1994 |

Table 1: Latin American Clone Consoles, 1973-1994.



[i] For the sake of brevity, this article uses the term *clone* to encompass a variety of hardware types identified by Ian Larson (2022), including those technically defined as clone consoles ("unlicensed reproductions of proprietary gaming hardware made to be compatible with a competitor's library of software"), bootleg consoles ("hardware that plays proprietary software without the consent of the platform holder and that violates a contemporary patent") and the products of piracy ("a complicated act of resistance against expanding global capitalism").

[ii] Unless otherwise noted, all English translations of Spanish and Portuguese sources are by the author. In the original Spanish: "Con respecto a la fecha de origen, la verdad que no he encontrado documentación, si algunas referencias orales, yo comento en la página que telematch tuvo la idea de ofrecer un pong alrededor del año 1973 ya que en una charla con gente relacionada a la informática que era de esa época, me habían comentado que la idea fue casi inmediata a la salida de la oddyssey, entiendo que menos de un año después, aparentemente trajeron una y la desarmaron para estudiarla en un proceso de ingeniería inversa o de "clonado", lamentablemente no puedo corroborar esa afirmación con pruebas ya que me la contó un ex compañero de trabajo en alguna charla distendida de un recreo, pero lamentablemente ya falleció."

[iii] In the original Spanish: "una avanzada de la Técnica Electrónica Aplicada"; "Telematch puede funcionar con cualquier receptor de TV instalado en el país, independientemente de la marca, antigüedad y/o modelo de que se trate, en cualquier horario, aunque no haya transmisión de televisión, ya que Telematch genera su propia imagen."

[iv] In the original Spanish: "consola atómica," "Perilla Biónica Antiaburrimiento" and "Sonido Tribiónico."

[v] In the original Spanish: "Programa Nº 4: FUTBOL -- El tanto o gol se convierte cuando la pelota pasa

por el arco."

[vi] In the original Portuguese: "Reserva do mercado de informática no Brasil."

[vii] Release dates referenced in the Appendix are estimated, frequently drawing on useful but incomplete and/or unverifiable data from fan communities and journalistic sources.