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The Black Box and Japanese Discourses of the Digital

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The article examines the figure of the black box in Japanese discourses of the digital, particularly as they apply to attempts to adapt older media, such as broadcast television, to the technological and commercial needs of new media. Analysis focuses on the implementation of the BS Conditional Access Systems (B-CAS) standard with the roll-out of digital broadcast in Japan during the first decade of the 21st century. Although B-CAS's addition reflected an attempt to bring television in line with the needs of contemporary intellectual property strategies, its implementation and defense reveal a wider spread of the black box as a trope of contemporary digital discourse in Japan. More ideological than technical fact, the black box and its imagined opacity serve as a warning against the unsanctioned use of digital technologies, drawing on a metaphor of opacity as a contagion that serves as an ideological stopgap for perceived shortcomings in digital control systems.

Keywords: Japan, digital, black box, digital broadcast, B-CAS, opacity, DRM, intellectual property, control, television

As the Electronic Frontier Foundation notes, the 2011 Anti-Counterfeiting Trade Agreement, or ACTA, would have "creat[ed] new global intellectual property (IP) enforcement standards that go beyond current international law" and "hand[ed] over increased authority to enforcement agencies . . . to seize any goods that are related to infringement activities . . . , criminalize circumvention of digital security technologies, and address piracy on digital networks" (Electronic Frontier Foundation, 2019, para. 1). Yet, although the ACTA received stiff domestic opposition in the United States and Europe at the time of its negotiation, the reaction in Japan was somewhat mixed. Although the government's support for the treaty met with outcry in some quarters, Japanese lawmakers quickly ratified it in 2012 while seeking to assure a skeptical public that the treaty would not significantly change existing legal frameworks as they applied to the "appropriate" use of digital and networked media (Nagasawa, 2012). Subsequent legislative moves have belied these assurances. Though the ACTA stalled because of opposition elsewhere, the Trans-Pacific Partnership (TPP), which Japan's governing Liberal Democrat Party supported, took up numerous antipiracy provisions contained within the ACTA. Aiming to smooth the way for TPP's adoption, the Japanese National Diet passed major revisions to existent copyright law in 2016 to bring it into line with the treaty and its provisions. To cite just two examples, the revisions—enacted in 2018 on the ratification of the renegotiated

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Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP; also referred to as TPP11 in Japan)—provided for the criminal prosecution of copyright violations, even in the absence of a complaint by copyright holders; they furthermore criminalized the use of devices and software systems that circumvent copyright controls (Agency for Cultural Affairs, 2020; Terakura, 2016, pp. 2, 6–8, 10; "TPP shōnin," 2016).

Although international frameworks like the TPP (and subsequently CPTPP) are not the specific focus of this article, their impact on Japanese copyright law highlights a larger point that I will seek to make. Often negotiated outside the visibility of public inquiry, legal and international frameworks reflect the transition of the so-called black box from a strictly technical paradigm to a dominant trope in the age of digital technologies. Addressing this shift, Pasquale (2015) has characterized it as the rise of a "Black Box Society," whose norms of opacity and secrecy have slowly eroded 20th-century liberal democratic ideals of transparency and openness. Indeed, copyright control mechanisms—which Japan's TPP-inspired copyright revisions sought to buttress—stand to have far-reaching social and cultural effects that are themselves arguably opaque. Discussing the case of digital rights management (DRM) systems, Gillespie (2007) notes that they hold "significant implications for both the production and circulation of culture, for the digital networks on which that culture will move, and for the practices and institutions that will accommodate decisions made in the courts and in the marketplace" (p. 10). A "technological fix," as Gillespie puts it, DRM occupies a prominent position at the heart of the international intellectual property regime that treaties like CPTPP seek to bolster. Furthermore, its impact on the movement of culture is not limited to any one domestic market. As Elkins (2019) highlights, DRM protocols, such as regional access restrictions, have inflected how culture flows across national borders in an age of on-demand streaming.

Pasquale is not alone in highlighting the prominence of the black box and its opacity as a contemporary cultural and social trope. As numerous commentators have remarked, the black box was foundational within the cybernetic theory that presaged contemporary information and digital technologies. Summarizing this influence, Franklin (2015) writes:

> The black box, within the history of cybernetics . . . , emblematizes the methodological principle that elements inherent and/or internal to a given object—be it understood as a machine, a biological organism, or a social being—can be excluded in favor of statistical methods based on inputs and outputs. (p. 92)

Franklin argues that, although this manifestation of the black box represented a specific concept used by midcentury researchers such as John von Neumann in their theorization of cybernetic systems, the black box as a trope has, at present, become a diffused one, in which it functions as "a source of vague metaphors" (p. 94). Although he concedes that the ambiguity of such metaphors places them within the maligned category of "vapor theory," Franklin reminds us that they nonetheless "constitut[e] the cultural layer of the dominant mode of production" at present and thus have significant consequences for how digital technologies are represented and deployed (p. xxii).

Others have critiqued the underlying assumption that modern-day, digital black boxes are, in fact, opaque, and they underscored that their impenetrability is more of a discursive and structural fact than a technical one. Taking up the case of proprietary algorithms, Kitchin highlights how these putative black

boxes are not so much opaque in and of themselves, as much as they and the processes that they incorporate have been "black boxed." Kitchin (2017) notes that public clarity about the operation and impact of algorithms is now more than ever of critical importance, and yet "such clarity is absent because . . . they are largely black boxed and beyond query or question" (p. 15). Kitchin's transformation of "black box" into a verb here is apt, since it underscores how black boxing is an ongoing action committed by specific actors and not the immutable state of an impenetrable physical object. This perspective has found resonance elsewhere. Responding to Kitchin, Klinger and Svensson (2018) argue, for example, that algorithmic processes "are not small black boxes" but instead represent the culmination of "programmers and software engineers' input of relevant criteria, a preselection of possible outcomes, and clear instructions" (p. 4658).

In what follows, I will examine the case of B-CAS to consider black boxing as a discursive process that follows from and seeks to supplement the technical one—that is, as a sublimation of the black box, through which it comes to serve as a consequential "source of vague metaphors," in the terms suggested by Franklin. A television access rights management system developed in the early 2000s alongside the roll-out of digital broadcast in Japan, B-CAS offers an example of black boxing that was devised to adapt broadcast media to the contemporary needs of Japan's media industries, particularly as they relate to controlling the circulation of digital content. Based on an encryption scheme that encodes and decodes terrestrial and satellite broadcasts, B-CAS uses an IC card inserted by the viewer into the television set to manage access and copying rights, black-boxing the mechanisms of broadcast content's delivery to the viewer's screen, as well as its subsequent circulation through other media.

B-CAS and its deployment, I will argue, reveals the reach of the black box within contemporary media technology and its discourse—what I will identify as an ascendant "black-box-ism" in discourses of the digital in Japan (as well as elsewhere)—while it highlights the importance of considering the impact of digital culture outside the well-tread grounds the Internet and social media. Inherent in discussions of B-CAS and other digital control systems, this black-box-ism insists that the black box be left opaque, and yet, it demands, at the same time, that users make themselves transparent to that same system. Through an analysis of B-CAS, I will demonstrate how black-box-ism represents one of the primary ideological underpinnings of digital media in Japan as they have become established during the first two decades of the 21st century. B-CAS captures in concrete terms this transition of the black box from physical object to vapory idea, since it largely alleviates the need for a set-top decoder box, as it integrates the walled-garden logic of this older, more tangible form of the black box within the television set. At the same time, the system has proven itself susceptible to exploit, which has led to a retrenchment of the black box as a trope whose opacity becomes intertwined with cognate metaphors of digital virality. Following my analysis of B-CAS and its discourse, I will propose in conclusion a generalization about the mixed nature of such ideological responses to the digital. The black box as a trope arises as a response to the perceived shortcomings of digital control systems, such as B-CAS, producing in the process a curious slippage. With its juxtaposition of opacity and transparency, it provides a visual metaphor to shore up what is, in essence, an antivisual paradigm.

Closing in Broadcast

Japan's transition to digital television broadcast during the 2000s transformed the medium, particularly as it was integrated within a broader range of cultural practices. Notably, terrestrial broadcast—alongside broadcasting satellite or BS television—remains a vital component of Japan's media landscape, where alternatives such as cable television failed to reach the market saturation that they achieved in the United States from the 1980s onward. Furthermore, despite challenges from new media, television in its more traditional sense still enjoys wide use. According to a 2018 survey conducted by Japan's public broadcaster NHK, Japanese, aged seven years and older, watch on average three hours and 34 minutes of terrestrial and BS television, up three minutes from the previous year (Hayashida, Saitō, Yamamoto, & Yoshifuji, 2018, pp. 88–89). This, however, is not to suggest that television remains unchanged as a medium. Sandvig (2015) has noted how the Internet, once imagined to be the "Anti-Television," has, with the growing dominance of video streaming, been "technologically retrofitted and transformed to make video distribution possible" (pp. 225–226) and, in the process, become more similar to the predecessor it was meant to replace. The story of digital broadcast in Japan provides the inverse of this narrative, since digitization refitted television to meet the needs of content producers and providers in a networked era.

Central to this refitting was the addition of a conditional access component—B-CAS—to digital broadcast's rollout in the early 2000s. Circumscribing access to broadcast content, B-CAS reshaped Japanese television by abridging the "broad" of broadcast and recasting Japanese television to more readily mimic the contours of a point-to-point network, in which content providers and rights holders could regulate access to and redistribution of content. Steinberg (2019) has highlighted how the emergence of platforms brought a walled garden logic to Japan's consumer Internet. B-CAS, in a sense, did much the same for television, integrating broadcast into the platform logic that increasingly finds purchase across the media landscape in Japan and elsewhere.

Initially developed for the introduction of digital satellite broadcast in Japan, B-CAS was later adopted in 2005 to digital terrestrial broadcast, which was then in its infancy (B-CAS, 2019c; Yoshino, 2005). Under standards agreed to by a consortium of broadcasters and technologies makers, digital television sets sold in Japan incorporate an integrated card reader for the B-CAS cards shipped with each set. To view both free and paid content, viewers must first insert the card, which provides and stores a series of decryption codes needed to unscramble broadcast content. In the system's original conception, the cards would offer subscribers an efficient means to access premium channels via satellite broadcast: with the card and a satellite-ready television or device, one could view content simply by registering his or her card's ID number with a premium broadcaster ("Dejitaru hōsō no tsukaikata," 2001). When digital terrestrial broadcasting began in 2003, on the other hand, viewers did not need the cards to view content on digital-ready devices. However, concerns soon arose among broadcasters, content producers, and other rights holders that, with digital broadcasting, viewers now possessed a ready means to record and distribute high-definition copies of broadcast content—concerns that were stoked by cases in the early 2000s of viewers selling recordings of free digital satellite broadcast over Internet auction ("Bangumi fusei kopī," 2002; Takase, 2009). In adopting B-CAS, terrestrial broadcasters originally considered it a stopgap measure against such incidents, since B-CAS, in its original form, implemented a copy-once protocol, which provided a means of regulating the afterlife of any copies that the viewer might make of programming. Yet, although

it was originally intended as a temporary measure (and despite widespread dissatisfaction with it on the part of viewers and even some manufacturers and content producers), B-CAS remains standard in Japan, although some aspects, such as its copy-once protocol, have been narrowly liberalized (Nozawa, 2009).

From the perspective of the end-user, at least, B-CAS functions as a black box in the classic sense: the viewer inserts the card into his or her television, which, in turn, allows him or her to watch broadcast content, while the inner workings of the system remain largely obscured. Included with the purchase of a new television set or receiver, the B-CAS card's use is governed by a shrink-wrap contract, under whose terms the cards are lent to the viewer while remaining the property of the B-CAS corporation. In its integrated circuit (IC), each card includes a unique identification number and master key (km), as well as the ability to store working keys (kw), scramble keys (ks), subscription information, and pay-per-view viewing history. The digital broadcast signal contains three components: (1) the viewing content in scrambled form, (2) an "entitlement control message" (ECM), and (3) an "entitlement management message" (EMM). The ECM is generalized to all eligible viewers and contains an encrypted scramble key; the EMM is specific to individual viewers and contains their subscription information and a working key in encrypted form, which can be accessed only with the specified user's km. On reception of the broadcast signal, the television set sends the ECM and EMM to the B-CAS unit for processing. If the viewer has access to the content, the km decrypts the working key and subscription information contained within the EMM; the working key is then used to decrypt the ks contained within the ECM. The program information is then compared with the subscription information also included within the EMM, and if the two match, the ks is returned to the television set or receiver, which uses it to descramble the viewing. Notably, since the kw and subscription information is subsequently stored within the B-CAS card's IC chip, individual viewer-specific EMMs do not need to be continually broadcast and are sent only when the viewer changes or initiates a new subscription (as described in Yamazaki, 2002).

In his discussion of the history of Japanese television, Lamarre (2018) emphasizes that it is overly simplistic to narrativize that history as a seamless "subsuming" of a "one-to-many" quality within a more contemporary "point-to-point" paradigm. Lamarre argues instead that we should consider the two aspects in terms of tendencies that "emerge together, polarized, introducing a charge and a resistance" (p. 173) and that have thus "assembled" in varying ratios over the longer history of telecommunications and broadcast. Lamarre's characterization of a longstanding negotiation between television's point-to-point and one-to-many aspects is instructive in the case of B-CAS. One way to frame B-CAS might be as a virtual point-to-point network overlaid broadcast television's traditional one-to-many model: while a uniform broadcast signal is transmitted to all receivers, the key-based decryption scheme allows for unique messages targeted to individual receivers (i.e., the EMM and the viewer-specific working key and subscription information encoded therein). Yet, though it is tempting to model B-CAS imposition of the point-to-point as a new turn in broadcast, Lamarre's intervention reminds us to consider that turn from a wider historical perspective. To illustrate his point, Lamarre raises the example of video recorders and video game consoles—boxes that were "wired" into the television set during the 1970s and '80s, thus accentuating a point-to-point aspect of television that had begun to be subsumed within the one-to-many tendency associated with "the wireless nature of broadcast" (p. 161). B-CAS might be understood as having accentuated rather than introduced a point-to-point tendency within television, particularly since, as already

suggested, it can be considered a descendant of such set-top boxes since it interiorizes the decoder box within the television set.

Of perhaps even greater relevance to the present discussion of B-CAS is the wider thrust of Lamarre's historical narrative, in which he portrays the proliferation of peripheral devices from the 1970s onward as a central force in integrating Japanese television into an expanding media ecology. Although these devices expanded the possibilities of the television set, they also worked to embed the medium within a wider network of cross-media flows, in which the television could be used to access not only broadcast content but also content such as direct-to-video films and video games. B-CAS extends this evolution, while reflecting the needs and realities of a changed media ecology. As a present-day corollary of the devices described by Lamarre, B-CAS manages television's integration into a media ecology, which descends from the one he addresses in the context of the 1970s and '80s but also which finds itself transformed. Whereas the television set of that era lay at the center of a media ecology that spread outward from it, television in the digital broadcast era represents simply one node in a network of numerous possible screens and platforms from which one can access content. B-CAS reflects this more fluid context, controlling what is displayed on the television screen, as well as managing the outward flow of high definition content from individual viewers' televisions (i.e., through the system's copy controls).

B-CAS's role within this more decentralized media ecology becomes clear when one considers how it complements the intellectual property regime at work behind the "media mix" franchises, which fill Japan's contemporary media landscape. As Steinberg (2012) notes, the "media mix" neologism first evolved as a marketing term in Japan during the 1960s and denotes at present a concept cognate to the notion of media convergence used elsewhere. As with media convergence, media mix franchises incorporate everything from television programming, *manga* comics, and video games, to collectible cards, stationery, and other paraphernalia. Against this backdrop, B-CAS intervenes to address a key dilemma of the media mix, as well as digital media in general. While media decentralization is essential to media mixes, as it allows for content's portability across platforms, the tendency toward dispersal creates a challenge for franchise's rights holders, since they must actively seek to circumscribe outward flow lest the franchise's brand become diluted.

Steinberg's own analysis of the media mix highlights a similar tension at work within the media mix and the decentralized network of devices and platforms that it leverages. As Steinberg describes the media mix, it is shaped by two opposing yet coequal poles, "attraction" and "diffusion." Importantly, attraction represents for Steinberg an "immaterial force" which contrasts diffusion's "material expansion" (p. 82). To illustrate this point, Steinberg raises the example of character franchises. Whereas diffusion is the concrete process by which spin-off products and media continue to spread "throughout the consumer's environment," attraction is the intangible force by which the character continues to draw these disparate parts of the mix to itself and thus "transfor[m] its surrounding ecology of things and media into character products" (p. 82). Steinberg addresses here the 1960s television anime *Tetsuwan atomu* (*Astro Boy*) as a precursor of contemporary media mixes, but his discussion applies just as well—if not better—to the latter in which a greater number of "things and media" populate present-day media ecologies. Here, Steinberg's attraction can be understood as a counterbalance to the dilution precipitated by the proliferation of media objects and platforms.

Steinberg's attraction-diffusion binary offers a productive one for appraising contemporary media ecologies. However, frameworks like B-CAS nonetheless throw into relief the more material forces that Japan's media industry has mobilized to manage and circumscribe the mix's dispersion. For Steinberg, attraction's mitigation of diffusion is a largely circular process in which the dispersal of character-branded products in consumers' environment further stokes their desire for the character and its products, thus strengthening the character's ability to maintain the centripetal pull that it exercises on its burgeoning media mix. B-CAS, on the other hand, provides an example of a concrete mechanism that Japan's media industries have put in place to modulate content's cross-platform flow and ensure that attraction takes place, notwithstanding the franchise's affective pull on the consumer. In an era of digital media, this is all the more imperative, since rights holders need to counteract dispersion's tendency toward dilution of the brand (as well as the proliferation of knockoffs and other unsanctioned copies) so as to ensure the media franchise remains monetizable.

Industry-side discussions of media mixes make clear that attempts to mediate their cross-platform spread are deliberate. An article in the weekly *Shūkan tōyō keizai* on the legal aspects of media mix and other intellectual property tellingly notes the need to legally "wall in" (*kakoikomu*) the media mix—or what it refers to as "killer content"—through careful planning and execution of the franchise (Fukuda, Mikami, & Ōsaka, 2007, pp. 42–43). As the article highlights, this typically requires the establishment early on of a consortium comprised of industry players, from the television networks to game producers, who will manage the rights to the franchise. The original creators of these properties conspicuously play a side role in these consortiums. The article, in fact, emphasizes that this is intentional. As the authors discuss, the consortium-based approach was established to prevent not only copyright violations, but also disagreements and violations that had afflicted earlier franchises when individual creators sought to assert their rights over those of industry entities.

B-CAS fits squarely within this larger goal of walling in content in an era of digital media and decentralized media ecologies. In the process of circumscribing the openness of television broadcast, it not only protects the interests of content producers; it brings the medium into line with the IP regime that Japan's entertainment industries have come to pursue more broadly, ensuring that broadcast content does not circulate too readily or freely. Just as B-CAS interiorizes the set-top box and its point-to-point logic within the television set, the access system interiorizes the objective of "walling in" the media mix within the media mix's own network of cross-media flows, acting as check-point as it controls the flow of content from broadcaster to television and from television outward.

Opacity as Virus

Attempts to manage the flow of digital content in Japan have not always been successful. Itself a stopgap measure, B-CAS has proven open to circumvention in certain cases. Indicative of the limits of B-CAS—and thus more broadly of attempts to "wall in" content in the digital era—are loopholes that are arguably built into it. Over the past decade, doctored B-CAS cards, which exploit these loopholes and mimic normal cards, have circulated, allowing some viewers free access to paid content (generally content broadcast over base satellite). Notably, externalities presented by digital networks facilitate the spread of such cards. Software, frequently made available on message boards, enables users to produce the cards by

overwriting the km on a card's IC with a new one that allows unlimited access to all channels, paid or free (Hisayama, 2012). As I will discuss in this section, the appearance of such exploits and the externalities that facilitate their spread present a fundamental challenge to B-CAS as a control system, precipitating an ideological response that seeks to shore up B-CAS's shortcomings. Drawing on the increasingly "vapory" nature of the black box paradigm, this ideological response frames the spread of the doctored cards and the unsanctioned access, which they enable, within the metaphor of virality.

Despite the complexity of its encryption scheme, one need only mimic a B-CAS km to gain access to protected content. The B-CAS system cannot verify unique ownership of a km, and since anyone with the appropriate keys can gain access to broadcast content, the B-CAS system has no way of preventing access by someone mimicking those keys. Doctored cards, often referred to colloquially as Black CAS cards, exploit this agnosticism toward user identity inherent within B-CAS, at the same undermining time the system's underlying structural logic: by mimicking an all-access km, the doctored card provides the viewer with unfettered access to terrestrial and satellite broadcast content. In terms of the discussion from the previous section, this allows a viewer with a doctored card to undo the point-to-point mechanism, which B-CAS integrates within broadcast's one-to-many structure, and thus threatens to revert television to a purely one-to-many paradigm.

In response to this shortcoming, authorities have moved aggressively to stem the creation, sale, and use of doctored B-CAS cards, typically identifying offenders at the point of sale and purchase of the cards through online auctions and similar platforms. Since 2012, prefectural police departments and prosecutors, generally under the auspices of cyber-crimes units, have arrested numerous individuals in related cases, charging them and winning convictions for violation of Japan's Unfair Competition Prevention Act (*Fuseikyōsōbōshihō*; for two examples of such convictions, see "B-CAS kādo kaizan ni yūzai hanketsu," 2013; "B-CAS tenbai de baishō teiso," 2012). Industry-side entities, such as the affected premium channels, have likewise sought punitive damages against convicted individuals through civil litigation (for example, "Fusei B-CAS de baishō teiso," 2014). Such efforts have not been restricted to Japan's national borders. As producers of the cards have faced steeper consequences, some have resorted to selling and shipping the cards from overseas, particularly from Taiwan; however, there has been at least one instance where Japanese authorities have liaised with their Taiwanese counterparts to prosecute and arrest the responsible parties (Taiwan International Patent & Law Office, 2015). Viewers who have purchased doctored cards tend to receive lighter treatment, although there have been cases where users have been convicted of offenses such as the use of unauthorized creation of personal electromagnetic payment records (*fusei sakushutsu shidenjiteki kiroku kyōyō*), for which they have been fined or even been imprisoned (see, for example, "Fusei shichō kādo," 2013; "Kaizan B-CAS," 2014.).

These legal efforts appear to have had some success as deterrent; however, their need underscores the inability to close B-CAS's loopholes through its own technical mechanisms. The ideological response that has accompanied enforcement efforts makes these limitations all the more conspicuous, given that the response is further removed from any actual technical reality of B-CAS or digital technologies in general. The doctored cards refunctionalize B-CAS's black box system by overriding the card's preset inputs with a new one (i.e., a new km), and yet, while the existence and circulation of doctored cards undermines the intended black box function of the B-CAS system in this manner, they do not, curiously, lead to a retreat of

the black box as abstract metaphor. Instead, as becomes apparent from an examination of the discourse surrounding B-CAS, the black box logic of the system is often totalized as a trope in such cases. Here, what I have termed black-box-ism emerges as an expression of moral panic, framing the imagined consequences of the doctored cards within the terms of viral spread and infection. As this metaphor of virality casts the problem of B-CAS's subversion, the implied breakdown of B-CAS's walling-in function threatens not only to unleash an unhampered spread of protected content; it threatens to undermine a more ambiguous containment of the black-box's opacity, which black-box-ism casts as a contagion when it is not properly cordoned within the limits of the functional black box.

Notably, the B-CAS corporation, which oversees the manufacture and distribution of the cards, is itself a sort of black box, as it operates with little transparency and bares no accountability to viewers. Although the company maintains a website, a large portion of the site's content serves to warn viewers against improper use of B-CAS cards, while providing only minimal information about the company, its stakeholders, its principle officers, and its operations (B-CAS, 2019d). Such black-box-ism, however, is only one part of the story. In what communications they do provide, such as website FAQs, PSAs, and so forth, the B-CAS corporation and the broadcasters, whose content it protects, deploy the opacity of the black box system as a warning. As it slips into these more abstract contexts, the black box as a trope takes on an ideological vector, in which it comes to function as a cautionary tale and frames misuse of the technology in the terms of a moral infraction. Here, the black box shifts from a technical and concrete reality to a specter and threat to the would-be offender who would seek to exploit or even examine the black box. By undermining the mechanism that ensures B-CAS's smooth operation, users of doctored cards, within the logic of black-box-ism, do not simply cause the system to malfunction; they threaten to undermine the boundaries that contain its opacity and keep it safely at bay from the public at large.

An early model for this ideological response—a response framed, once again, in moralistic terms through a metaphor of viral spread—was arguably provided by the response to peer-to-peer (p2p) sharing platforms in the early 2000s. Indeed, many of the issues, which characterized B-CAS's initial adoption and later exploits, similarly animated the controversies that greeted p2p sharing. As was the case elsewhere, the spread of p2p-sharing software in Japan—particularly during the first half of the 2000s—stoked concerns on the side of rights holders and the entertainment industry. Although p2p applications such as Napster and Limewire gained traction in Japan, perhaps the most notorious was the domestically produced Winny program. Based on the Freenet platform and first released in 2002, Winny used a decentralized system known as a distributed data store to facilitate the exchange of data. Under this model, Winny clients would exchange packets of data, which, stored as cache files, included both file data and client lists. Since the data remained encrypted at all times, users had no way of knowing which client on the network was the source of the file they were downloading, or what information was being stored on their own computers. This decentralized model contrasted predecessors that, like Napster, maintained a centralized client list, while it provided Winny users fuller anonymity (Matsunawa, 2009; Nawa, 2004; Oka, 2004).

Winny's popularity in the mid-2000s led almost immediately to legal challenges. In 2004, Kyoto prefectural police arrested the application's creator, Kaneko Isamu, on charges of assisting in copyright violations, leading to a drawn-out legal battle that ended only in 2011, when Japan's supreme court overturned Kaneko's initial conviction (Kaneko, 2018; Oka, 2012). In addition to these legal woes, Winny

faced a spate of negative media coverage as Winny-related information breaches gained national attention. In these incidents, the program distributed users' personal information and files without their knowledge, usually after their computers had become infected by viruses that targeted Winny. In 2004 and again in 2006, for example, computers connected to the Japan's Self-Defense Forces became infected, leading in both cases to the leak of sensitive military documents ("Kaiji 'hi' jōhō," 2006; "Rikuji shiryō netto," 2004). Similarly, in 2007, a Winny virus infected computers used by the Tokyo Metropolitan Police Department, causing the leak of personal information and other documents related to police investigations ("Keishichō 1 manken," 2007). In addition to the role of viruses, numerous accounts of the incidents pointed to Winny's unique method of sharing data as equally to blame. Once a Winny client shared data across the program's network, copies of the leaked data became impossible to track down and erase in their entirety, stored as they were in other clients' encrypted caches (Saitō, 2006, pp. 25–27). In such cases, anonymity and encryption became liabilities and threatened the identity they were promised to protect.

Similar themes of virality and digital anonymity's threat to identity can be seen in the antihacking campaigns, which have been produced by the B-CAS corporation and other industry entities in response to the spread of doctored cards. In one television advertisement released by the Japan Satellite Broadcasting Association (Eiseihōsō kyōkai; hereafter, JSBA) in late 2012, Konishi Saeka, a model and winner of the 2009 Japan Bishōjo beauty contest, warns viewers against using the cards (for press release, see Japan Satellite Broadcasting Association, 2012a). Pictured watching television in a living room, she turns to the camera and thanks viewers for watching television on BS broadcast. She then leans closer into the camera, and her demeanor shifts. Watching paid content is good, but using a doctored card to do so is against the law, she chides the viewer. In its casting of Konishi, the advertisement's messaging is barely subtle (and notably gendered in its assumptions about the primary demographic responsible for producing and using doctored cards). To realize and enjoy the promise of digital television—here the promise of viewing the young female object of male desire in high definition—one must do so through the sanctioned use of the digital broadcast apparatus as provided. The setting is likewise significant: the white tone living room, from which Konishi watches, is well-lit and minimally filled with off-white furniture, suggesting similar themes of clarity and transparency. In contrast, it portrays doctored cards in terms of an almost comical malignancy. As Konishi describes the danger of using the cards, a cartoon B-CAS card appears next to her. The card's cartoon face bears an expression of smiling innocence, but this quickly transitions to one of grinning corruption, as black ink trickles over its surface and covers it to imply a doctored card (as reposted by Bottled Sodas, 2013).

The B-CAS corporation's website features similar messaging, emphasizing the same images of opaque virality suggested by the JSBA advertisement's cartoon portrayal of doctored cards. The website's splash-page prominently displays images of B-CAS cards overlaid in a picture of an idealized living space, in which a wide-screen television sits in the center of a naturally and well-lit living room and kitchen. Reminiscent of the JSBA advertisement's setting, the living space pictured on the B-CAS website is filled sparingly with white furniture set against a background of crisp, off-white walls (B-CAS, 2019a). Doctored cards, on the other hand, are depicted once again in a comical yet malignant vein. On a subpage of the website, labelled "About the law" (hōritsu ni tsuite), the corporation warns viewers against the use of doctored cards, noting the illegality of their use—a warning that is emphasized by a series of graphics meant to visualize the dangers associated with using the cards. Advising viewers not to produce, use or sell hacked cards, the illustrations represent these acts through a visual grammar more typical of that used to depict

computer viruses and malware, featuring black viruslike blobs floating out of a computer screen and being transferred to a television screen. In each frame, the potential criminal is depicted only in featureless silhouette, suggesting a similar spread to the user (B-CAS, 2019b).

It is telling that both the JSBA advertisement and the B-CAS website deploy the language of virality, even though the relation of virality to the hacked cards is tangential at best. Because of the prominence of Winny-related incidents, one can surmise how the figure of the virus, which played a key role in data breaching incidents, came to merge in the discursive imaginary with the exploitation of digital systems. This merging is perhaps unsurprising given the long-standing intertwinement of virality and digital technologies, which Parikka (2007) documents at length. The B-CAS site certainly seeks to leverage the confusion between virus and hack, while it also gestures toward the threat to identity that Winny's anonymity supposedly posed. The use of doctored cards, the site's illustrations imply, represents a form of virality whose contagion can also infect viewers themselves. Significantly, the black box's opacity slips here from a technical possibility of the system to a specter that hovers over the technology, warning against its unsanctioned use.

Unpacking the Black Box

The juxtaposition of transparency and opacity, in both the JCBA advertisement and the B-CAS website, is telling in what it reveals about the ideological discourse surrounding digital technologies and what I have referred to as the strain of black-box-ism that animates it. Managing the flow of data from point to point and device to device, the B-CAS system arguably manifests a shift to what Deleuze identified as one to postdisciplinarian control societies. B-CAS, alongside similar strategies, modulates the movement of content data, controlling its decryption, transcription, and reencryption. Importantly, the mechanisms of the control society per Deleuze are agnostic vis-à-vis identity: "in society of control, . . . what is important is no longer either a signature or a number, but a code" that "mark[s] access to information, or reject[s] it" (Deleuze, 1992, p. 5). As has been seen, B-CAS remains consistent in this regard. Without a requirement to register the B-CAS cards, the cards' ID numbers and kms serve not to identify the viewer but simply to grant them or anyone in possession of the card access to content. Considered more radically, the cards and their codes care little about the human actors and their desires to view content; rather, they exist as a system to regulate the flow of broadcast content as information, first from the broadcaster to individual receivers and thereafter from recording devices to storage devices.

The language of the Deleuzian control system, however, is one of invisibility, since the mechanisms operate largely outside the visible. Although this may be consistent with B-CAS as a technical platform, the language of black-box-ism—language seen for example in the JCBA advertisement and B-CAS website—is a visual one of transparency versus opacity, which more readily hews to the logic of the Foucauldian disciplinary society—a stage of state power that Deleuze argues that the control society model replaces. In his description of the disciplinary society, Foucault foregrounds the transparency-opacity binary in his reading of Jeremy Bentham's panopticon, whose deployment of surveillance emblematizes a core structure of disciplinary power. Foucault contends that the panopticon's power lies not only in its ability to surveil prisoners but also in its ability to establish an "automatic functioning of power" contingent on the opacity of the guard tower. Although the prisoners are always visible within the panopticon, the interior of the guard tower remains obscured from view. As a result, the prisoner assumes they are being watched even when

they are not, internalizing the act of surveillance as an act of self-regulation. For Foucault, this act of self-regulation represents a quintessential trope of power and its exercise in disciplinary societies, as all subjects—prisoners or otherwise—assume the habit of self-surveillance (Foucault, 1995, pp. 200–202).

Yet, while the visual language of black-box-ism resonates more tangibly with the Foucauldian paradigm, it makes notable adjustments. B-CAS after all has, as already noted, few practical means of surveilling and identifying individual viewers. The Foucauldian surveillance paradigm (like black-box-ism itself) becomes in this case largely divorced from its original context and functions instead to primarily justify the closed-source nature of the control mechanisms at work in B-CAS. Notably, in the example of Foucault's panopticon, state authority gazes on the subject of power from a position of opaque privilege; however, viewers, in the case of B-CAS's education campaign, are invited to partake in a similar experience of privileged viewing, while they are cautioned at the same time against the ultimate privilege of observing from the position of obscurity. Both the JCBA ad and the B-CAS website visualize the ideal site of sanctioned viewing along the same lines, as both feature images of flat-screen televisions in well-lit living rooms uncluttered by the mess of normal living and filled only sparingly with furniture in soft whites. It is such "clean" settings, and such settings alone, from which antidoctoring propaganda invites viewers to gaze on the putatively clear images of digital television, such as—in the case of the advertisement—the crystal-clear images of the young female model. Hidden within such positivistic images is once again the warning: enjoy such images from a position of transparency (i.e., identifiability) and do not seek to assume the position of opacity, lest it infect you and thus close you off from the clarity of sanctioned access and, perhaps more importantly, high-definition viewing.

The case of B-CAS furthermore throws into relief how discourses of the digital have come to saturate areas of media culture beyond the more obvious ones of the Internet and social media. Indeed, the initial justifications for B-CAS and the subsequent ideological response to its exploits hew to broader trends in how digital technologies' perceived dangers have been presented and addressed, particularly in the closely related history of DRM. In his discussion of DRM, Gillespie (2007) notes that, in the North American case, the introduction of the Internet was accompanied by utopic visions of its potential to liberate society and fix its ills. At the same time, suspicions about its less desirable uses abounded, particularly as they applied to the spread of media piracy. Devised as a "technological fix" to address the latter, according to Gillespie, DRM promised "a technical solution so that [the Internet's] liberatory promise [could] be fulfilled" (p. 5). In a similar vein, Parikka (2007) highlights in his media archeology of the computer virus how, as it rose to prominence as threat during the 1980s, a parallel discourse emerged around personal computer use, which emphasized the need for individuals to exercise "computer hygiene" (p. 162). "Personal computers were supposed to be 'about freedom and simplicity, not bureaucracy,'" he writes, and yet, "security and hierarchies were simultaneously touted as indispensable safeguards" (p. 167). This contradiction, he argues, resulted in a moral imperative to users that they exercise "constant self-control and self-supervision to ensure the functioning of the system"—an invective that he compares to Foucault's "care of self" (pp. 164, 167).

In her discussion of the early years of the commercial Internet, Chun (2006) diagnoses in such fears a type of agoraphobia, particularly as they apply to digital networks. The contemporary Internet, she notes, is by its very nature open, flouting attempts by the individual to exercise control over the outward flow of personal information and other data, since use of the Internet is predicated on the "routine, necessary, and nonceasing transmission of packets, which are constantly opened, broadcast, redirected, and possibly misdirected . . ." (p.

249). Drawing on Rosalyn Deutsche, Chun argues that this radical openness of the Internet precipitates an agoraphobia similar to that defined by Deutsche, which seeks out the impossibility of safe public spaces cordoned off from the chaos of the masses. When mapped on to the chaos of networked communications, this agoraphobia, according to Chun, expresses itself as a paranoia that seeks to create safe spaces on the Internet. Chun contends that, while such agoraphobia is apparent in "paranoid narratives of Big Brother's all-seeing and all-archiving eye" (p. 249), it is also evident in "procensorship arguments that divide online contact into the good and the bad" and posit that "the Internet would be a safe space if only pornography and other objectionable materials were eradicated" (p. 248).

B-CAS and its black box discourse highlight how media and technology companies have leveraged such agoraphobia to their advantage in justifying moves over the past two decades to figuratively close in digital media's tendencies toward outward spread. As Vaidhyanathan (2011)'s discussion of Google suggests, this process was already underway during the first decade of the 21st century, as consumers accepted the growing dominance of the Internet by companies such as Google, which promised to bring order to the perceived chaos of the open Internet (pp. 15–16, 22–23). To this history, one might also add the subsequent ascendance of "walled garden" platforms, such as Facebook, which offer a supposedly protected and curated digital space. As is well known, the majority of these platforms condition access on the user's agreement to make themselves transparent to the platform through a one-way sharing of personal information, while they remain themselves opaque about how they use that data. B-CAS and the justifications, which have been deployed on its behalf, parallel these Internet-related developments, both in terms of the timing of their emergence and in terms of the anxieties which they channel.

The black-box-ism of B-CAS furthermore foregrounds the challenges that confront attempts to unpack its opacity, while it nonetheless underscores the necessity of doing so. In a discussion of the black box, Galloway (2012) treats the trope as emblematic of a "specific kind of blackness" that has "begun to permeate cybernetic societies . . ." and "is not simply an effect of cybernetic societies but is in fact a necessary precondition for them" (p. 239). The opacity of the black box has become so pervasive, Galloway (2012) argues, that it "is no longer a question of illuminating the black box by decoding it, but rather that of functionalizing the black box by programming it" (p. 244). Although the black-box-ism of B-CAS discourse highlights the veracity of Galloway's insight that the black box's opacity has come to "permeate" contemporary society, it also suggests the limit of the move to appropriate and recode that opacity. A strategy that seems to overwhelm tactics of isolated exploitation, the black-box-ism apparent in B-CAS and its discourse stages an inversion. It reframes transparency, casting it as something that we should no longer expect from media and digital technologies, but that we owe to them, while it reserves opacity as a right of the institutions and entities that maintain the black box. When confronting this strategy, attempts to recode its claim to opacity would still do well to understand the processes and mechanisms that institute it.

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