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Copyright and the modern car: Colliding visions of the public good in DMCA section 1201 anti-circumvention proceedings

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Abstract

In 2015, a debate unfolded over who should be allowed to access vehicular software for the purposes of repair, maintenance, and modification. Conducted as part of the triennial anticircumvention exemptions proceedings of the Digital Millennium Copyright Act, this debate surfaced tensions that had long been brewing about copyright's applicability to computer software, with the added complication that rather than personal computers, the devices being discussed were cars, trucks, and tractors. At stake was whether copyright was the appropriate tool for striking the balance between economic incentivization and individual autonomy—and whether that was really the balance in question. I argue, rather, that while copyright law has been written and interpreted with these two conflicting goals in mind, a third goal is possible: the public good served through communal and sustainable commitments. By re-prioritizing this goal, we could rewrite copyright to could lead us to a more equitable future.

Keywords

Cars, copyright, Digital Millennium Copyright Act, intellectual property, ownership, software-enabled devices, law, technological protection measures (TPMs)

In April 2015, John Deere made headlines for a letter it sent to its dealers, a rebuttal to a *WIRED* magazine op-ed that had criticized the company's stance, in an ongoing debate over whether farmers should be able to repair their own tractors themselves, that copyright law was an appropriate justification for prohibiting vehicle owners from accessing

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the software on their vehicles for the purposes of repair, maintenance, or lawful modification (Havens and Hart, 2015; Wiens, 2015). In response to the op-ed, John Deere's letter to dealers asserted, inaccurately, that because copyright kept people from modifying the books and movies they own, so too does it prohibit farmers from making their own repairs. Not only were these prohibitions supposedly necessary for protecting John Deere's investments, but also for ensuring the safe functioning of their equipment. For many farmers, this came as news. Farmers, a notably self-sufficient community, have always made repairs on their own equipment. How did putting a computer on a tractor change this, and how was copyright, of all things, the mechanism locking them out?

The answer to this stems from a decades-old decision. In 1975, as Congress struggled to update copyright law to keep up with technological advancements. It convened the National Commission on New Technological Uses of Copyrighted Works (CONTU), a committee tasked with determining how IP law should respond to new computing technologies. Noting how software was changing the face of business enterprise, and wanting to encourage further innovation, CONTU eventually recommended that copyright be extended to protect computer programs (National Commission on New Technological Uses of Copyrighted Works, 1978). This recommendation was incorporated as Section 117 of the Copyright Act. Dissenting commissioners voiced concerns that this decision would push copyright law "beyond the breaking point" (National Commission on New Technological Uses of Copyrighted Works, 1978: 26; quoted in Samuelson, 1984: 666).

We have entered an age where copyright law is being applied in circumstances that the members of CONTU, could not have foreseen—perhaps toward the breaking point that the dissenting CONTU commissioners feared. Today, software is the bedrock not only of our personal computers, but also of many of our most mundane, everyday objects. Coffeemakers, refrigerators, thermostats, and even cars and tractors, are all increasingly computerized and networked. Because these objects carry software, owners may find themselves in the surprising position of violating copyright law in the simple act of repairing their computerized objects, or facing laws that completely skirt copyright at all by establishing prohibitions that supersede the traditional limitations of copyright holders' power.

In 2015, this tension—between a copyright holder's right to protect their intellectual property, and an owner's right to repair their devices—came to a head during a triennial proceeding overseen by the Library of Congress. A coalition of digital rights activists, Right to Repair advocates, farmers, and car owners came together to argue that vehicle owners should be exempt from the copyright law that constrained their ability to repair and modify their vehicles. For some, this was personal: people should be able to fix their cars! For others, this was a battle in a larger war over the meaning of ownership in a world of increasingly ubiquitous computing: who controls a device, the consumer who paid for it, or the corporation who holds copyrights on it?

Legal scholarship has pondered the challenge that digital technologies pose to IP and ownership for decades. Even before Congress wrote Section 117 into the Copyright Act, Justice Stephen Breyer worried about applying copyright protection to computer programs, concerned that copyright would impose significant costs and encourage anticompetitive behavior (Breyer, 1970). And while legal scholar Pamela Samuelson (2010) has argued that Breyer's original doubts no longer resonate—studies suggest that software copyright was a major factor in the industry's growth—she also notes that emerging trends are turning

against the case for copyright protection for computer software. These trends include, among other things, the increasing ubiquity of software embedded in common consumer goods and the use of technological protection measures to restrict access to that software. Other legal scholars have expressed concerns that these technological and legal trends have resulted in copyright laws being applied to digital objects in a manner inconsistent with the expectations people have over what they can and cannot do with their stuff, to the advantage of corporate control and profit over individual autonomy (Perzanowski and Schultz, 2016).

These issues are poignant for communications research. As scholars like Aufderheide and Jaszi (2018), Sinnreich (2010), and others have shown, lay understandings of how copyright determines ownership and access have real impacts on cultural production like documentary filmmaking, remixed music, and fan works. Expert interpretations, both legal and technical, are also significantly influenced by cultural assumptions about the function of copyright, the nature of speech and expression, and the concept of authorship (Coleman, 2012; Petersen, 2015). However, by coding copyright functions into the design of digital technologies, corporations have exerted new levels of control over users, thus resulting in new interpretations and implementations of copyright restrictions (Gillespie, 2009; Vaidhyanathan, 2003). These threads of scholarship urge us to interrogate how a copyright law that was written to empower the creative industries deals with devices that fall out of its typical purview; how courts, activists, and corporate interests interpret the law differently; and what visions of repair, ownership, and a digital future these interpretations belie.

This article investigates the competing interpretations at play in debates over whether and how copyright law has a place in controlling certain uses of software-enabled consumer devices, specifically, cars. It proceeds with a brief overview of the Digital Millennium Copyright Act (DMCA), and how car software was put forward as a possible exemption from this law. I follow with a close analysis of the arguments used by proponents and opponents in the ensuing debates. Through this analysis, I reveal that the DMCA has been written so narrowly, and interpreted so rigidly, that it has come to privilege two discourses: one where copyright serves to further economic interests first and foremost, and another where individual liberty is what matters most. Granted, each side of this debate may claim that they are simply trying to build a copyright regime that serves the public good, whether through encouraging economic growth or individual autonomy. However, I argue that limiting our understanding of the public good, and how copyright might protect and encourage it, to either of those frames dangerously limits our ability to think through how digital technologies are reshaping our world. And while this particular case ends happily—advocates won the right to repair their vehicles—the frayed edges of the final decision urge us to reconsider whether the US copyright regime must be rewritten to invite new ways of understanding and adjudicating the relationship between digital artifacts, ownership, and the public good.

Regulating replication: the Digital Millennium Copyright Act

The late twentieth century saw the development of several technologies that made copying creative expressions easy—photocopying machines, cassette tapes, and eventually the Internet. Content industries responded to these threats by pushing for aggressive

regimes of regulation (Lessig, 2006: 173). These efforts culminated in the Digital Millennium Copyright Act of 1998, the drafting of which was the result of "multilateral, interindustry negotiation" in which "[c]opyright owners secured new rights defined in language designed to prevent the discovery of loopholes, and granted a diverse roster of powerful players narrow, detailed, and incomprehensibly drawn exceptions" (Litman, 2001: 25). One of the most controversial provisions in the bill was Section 1201, known as the anti-circumvention provision. This section restricts the circumvention of "technological protection mechanisms" (TPMs) that protect copyrighted content, and prohibits the trafficking of tools that make circumvention possible. Some examples of TPMs include programs that make DVDs playable only in certain regions, those that keep CDs from being copied, and those that allow a printer to use only manufacturer-approved print cartridges. Section 1201 makes it illegal to bypass those programs.

One of the strongest objections levied against Section 1201 was that its prohibitions stand regardless of whether a user circumvents a TPM for non-copyright-infringing activities. While Congress did provide some statutory exemptions from Section 1201, these exceptions were narrowly drawn, and did not include other legal uses of copyrighted content such as fair use. The broadest exception Section 1201 provides is an administrative rulemaking proceeding used to determine additional exceptions. During this process, which takes place every 3 years under the purview of the Library of Congress (which houses the US Copyright Office), the public presents arguments for and against granting specific classes of copyrighted works exemptions from the anti-circumvention rules. These exemptions are only applicable for 3 years; classes that had previously been granted exemptions are likely, but not guaranteed, to obtain exemptions in the next round.

In theory, this triennial process could be a powerful tool for representing the public interest. The process was added to the DMCA by the House Committee on Commerce out of a concern that the development of digital technologies might otherwise leave consumers locked out of lawful access to copyrighted works (105th Congress, 1998: 36). However, historical research into the drafting of the DMCA reveals that the process was a last-minute addition as part of an ultimately failed attempt to codify fair use in the text of the law (Bello and Aufderheide, 2021). Consequently, scholars have concluded that the procedure actually weakens the role of courts, and thus also the power of limitations to copyright like fair use; in practice "the rulemaking procedure does not appear to be an earnest attempt to provide meaningful relief to adversely affected noninfringing users" (Herman and Gandy, 2006: 124; see also Aufderheide et al., 2018). In the House Committee hearings about the DMCA, 'witnesses all but explicitly agreed that the act was designed from the very beginning to benefit the copyright industries (and, after substantial amendment, perhaps not harm other industries too badly) at the public's expense' (Herman and Gandy, 2006: 133). Of additional concern is how the Copyright Office, which oversees the triennial process, has consistently prioritized the interests of copyright holders. While this varies depending on leadership, in 2015 the Copyright Office's director, Maria Pallante, was seen as particularly sympathetic to the content industries' interests (Albanese, 2016).

Given how the DMCA seems to consolidate power with powerful players, there has been concern over how broadly written the statute is (Fairfield, 2017). In her history of the development and passage of the DMCA, Litman (2001) details how the content

industries wielded enormous lobbying power to ensure the DMCA would written to be largely interpreted in their favor. Scholars have also noted how Section 1201 of the DMCA functionally criminalizes decryption in a way that makes it technically a non-copyright law while still requiring defendants to engage with copyright (Gillespie, 2009; Seltzer, 2010). Others have pointed out how the broad language of the statute has implications beyond IP law; the Electronic Frontier Foundation (EFF) sued the federal government over Section 1201 in 2016, arguing that it represents an unconstitutional ban on protected speech (Electronic Frontier Foundation, 2016). By examining these triennial proceedings to reveal which actors push which ways of interpreting copyright and digital technology, we can better see the ideological underpinnings of many mainstream legal and cultural understandings of copyright and digital technology. And what's more, by surfacing the assumptions at play, we can begin to see the ideological approaches that have been left behind, foreclosed, or buried.

The 2015 exemption cycle

The triennial exemptions proceedings are a months-long process during which civic groups, industry organizations, and members of the public submit arguments supporting or opposing a class of works for exemption from the prohibitions of Section 1201. The 2015 cycle went thusly: In late 2014, the Library of Congress (LOC) initiated the process by requesting petitions on which classes of works should be exempted, and why. From these, the LOC developed a list of proposed classes and invited comments. These comments happened in three waves: (1) supporting or neutral comments; (2) opposing comments, and (3) rebuttals (called Reply Comments). Public hearings were also held. Finally, the LOC, in consultation with the Register of Copyrights, published its evaluation of the arguments, and its final determination on which classes would receive exemptions.

In 2015, the LOC organized the exemption proposals it received into 27 proposed classes. For the most part, these classes covered devices that have always been digital: e-books, wireless telephone headsets, tablet computers, etc. However, this year, three organizations proposed a class that was relatively newly digital: cars. The LOC combined these proposals into "Class 21, Vehicle Software—Diagnosis, Repair, or Modification." Over the next three stages of the comments submission, the LOC received comments from 20 organizations (14 in support or neutral, 6 opposing) and 2599 individuals (2582 of which were submitted through the website of the advocacy organization Digital Right to Repair) regarding Class 21. The organizations supporting the exemption included digital rights organizations like the EFF and right-to-repair organizations like iFixit and Farm Hack. The organizations opposing the exemption were almost exclusively original equipment manufacturers (OEMs) like General Motors and John Deere, or industry associations representing them.

Most of the organizations to submit comments were law-related nonprofits or university law clinics, or organizations with the resources to hire lawyers to draft comments. Most of the individuals to submit comments, on the other hand, did not identify as legally trained. This disparity in legal know-how had an impact on the evidence the LOC used to support their reasoning; in its final report, the LOC heavily references the work of the EFF and USC IPT, but only uses the testimony of two individuals, Craig Smith (founder

of the car hacking community Open Garages) and Kyle Wiens (co-founder of repair organization iFixit), in spite of receiving nearly 2600 individual submissions. While the vast majority of these were form letters provided by the Digital Right to Repair Committee, nearly 300 included significant additions wherein commenters inserted their own arguments for the exemption.

This gap between the LOC's reference to legally trained versus lay submissions is an early indication of the approaches to copyright, software, and ownership given weight during these proceedings. While the Section 1201 exemptions process is technically a public process, commenters who are not lawyers with experience in IP law are rarely acknowledged. This is pattern that has been noted across most rulemaking procedures with public commenting periods; agencies are more likely to listen to commenters who have a more detailed understanding of the issues in question and the procedural steps of agency rulemaking, which is usually those with institutional expertise and power (Cuellar, 2005). This is perhaps not surprising; what agencies look for in public comments are novel, factual, and, ideally, technical arguments. This is partially self-defense; rule changes are open to judicial challenge if they seem to go beyond a "logical outgrowth" of the content of the proposed rule, thus incentivizing agencies to focus on comments containing technical evidence. Responding to values-focused comments leaves federal agencies vulnerable to challenge (Mendelson, 2011). However, critics of this approach argue that the dismissal of seemingly value-based comments is rooted in the assumption that all federal rulemakings are purely technical, when in fact they often contain many value-laden decisions (Mendelson, 2011). The end result was that the everyday, lived experience of these technologies did not seem to weigh into how the LOC constructed their legitimate social meanings and uses. Instead, by almost exclusively listening to already powerful commenters, these federal agencies wind up reifying and perpetuating conventional interpretations of these laws, which (it bears repeating) tend to privilege powerful interests.

Making the case for/against vehicle software

In order to merit an exemption, proponents had to meet certain requirements: first, persuade the LOC that the ways the copyrighted works in question would get used were non-infringing; and second, demonstrate that the inability to circumvent the TPMs protecting those works was having an adverse effect on those noninfringing uses. In 2015, meeting those requirements boiled down to four major questions. Two concerned the applicability of Section 117 of the Copyright Act, which establishes limitations on a copyright holder's rights over copyrighted software. The first was the issue of *who could be considered the owner* of a copy of a piece of software, as only owners of a copy can make use of the Section 117 limitations. The second concerned an often overlooked requirement of Section 117, subsection (A)(1), which states that owners of a copy of a computer program may make copies or adaptations of that program, so long as "such a new copy or adaptation is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner." Petitioners tussled over *what actions could be considered an "essential step"* in using vehicle software. The remaining two questions did not engage with the issue of copyright at all,

focusing instead on the non-copyright-related stipulations of the anti-circumvention provision. The third question concerned the second part of the requirements for earning an exemption, that proponents be able to show the TPMs in question were currently causing, or would likely cause, an *adverse impact* on those non-infringing uses. The last issue surfaced in these debates was how to *balance the supposed interests of the public* (for environmental protection and safety) *with the rights of private ownership*. This section considers how petitioners answered these questions. Ultimately, I find that the evidence petitioners thought would be most persuasive was either about economic interest or individual autonomy. However, by the end, even the LOC was troubled by how constructing the debate in these two terms rendered it incapable of resolving longer-term tensions about the public good.

Who is an owner?

US copyright law accords a number of rights to the owner of a copy of a copyrighted work, and considers these to be non-infringing activities. Consider a book you own: you can do whatever you want with it as long as you don't reprint it and sell those reprints. Similarly, advocates for the exemption for car software understood that being acknowledged as the owner of a copy is a powerful first step in establishing that the uses you would make of a copy of a work are non-infringing.

For most advocates, it was self-evident that vehicles owners also owned the copy of the software on those vehicles. This claim was based on the fact that the software and the hardware are functionally inextricable, and the way vehicle owners interact with their vehicles. Many proponents noted that making the distinction between the software and the physical equipment was impractical. In their statement, Farm Hack, an organization of farmers who repair and modify their own tools, did not make a distinction between the software and the physical equipment. The Auto Care Association (ACA) and the Automotive Parts Remanufactures Association (APRA) (2015) touched on how the software that runs car engines is "functionally integrated with and, as a practical matter, inseparable from physical engine parts" (p. 2). The USC IPT (2015) echoed this reasoning; because farm machinery requires software in order to function, most owners "do not distinguish between the software and the physical machine" (p. 9). Modern vehicles do not function without software, and so vehicle owners understandably experience them not as separate products but as one and the same. Thus, proponents argued, software should as accessible for repair and modifications purposes as the mechanical components.

The EFF pointed out that this reasoning had support in case precedence, gesturing to the court's acknowledgment of the experiential nature of ownership in *Krause v. Titleserv Inc III* (2005):

> [W]hile vehicle owners do not have explicit title in the ECU firmware, they do have indicia of ownership. When purchasing the vehicle, they possess a copy of the software inside, and they retain the ability to transfer and dispose of the software freely along with the vehicle. The manufacturer does not retain rights to repossess the copy. (Electronic Frontier Foundation, 2015a: 13)

The ACA and the APRA put forward a similar analysis of *Vernor v. Autodesk Inc.* (2010), namely that vehicle owners are owners and not licensees of their vehicles' software because they may freely resell their vehicles (and the software on them), since vehicle manufacturers do not restrict that right through any license (ACA and APRA, 2015: 7). Proponents argued that, while the strictest technical definition of ownership is the passage of title from one party to another, in practice ownership is often more about the degree of autonomy and control the buyer experiences over their property.

Opponents, on the other hand, argued that vehicle owners' belief that they own the copy of the software on their cars was false; owners' lived realities did not supersede the legal restrictions they had presumably agreed to. Opponents asserted that none of the proponents had provided explicit evidence that vehicle owners owned the copy of the software in their vehicles, thus proving that vehicle owners were in fact only implied licensees (Auto Alliance, 2015; General Motors, 2015). The observation that proponents lacked such evidence was technically accurate. Proponents' arguments that car owners are also owners of a copy of the software was premised on the lack of evidence to the contrary; the EFF included examples of the only licenses they could find, all pertaining to entertainment- or navigation-related programs found in cars, rather than the engine software. For the EFF, this demonstrated that car companies cannot claim that they intend an implicit license agreement when they are clearly capable of making car buyers sign license agreements for some parts of car software but not others. For opponents, these written licenses were examples that an implicit licensor-licensee relationship *was* in fact established with car buyers. John Deere (2015) went one step further, claiming that the lack of a written license was actually evidence of an implied license: "In the absence of an express written license in conjunction with the purchase of the vehicle, the vehicle owner receives an implied license for the life of the vehicle to operate the vehicle" (p. 6). For opponents, ownership is not a question of experience, but a formal legal agreement. What's more, this argument makes it clear that while proponents see the car and its software as one and the same (or at least fundamentally inextricable), opponents view them as two distinct things, subject to different norms of sale, transferal, and control.

What is an essential step?

Once advocates had demonstrated why they believed had established that car owners are the owners a copy of the car's software, they turned to addressing how the remainder of Section 117 supported the proposed exemption. Specifically, they moved on to subsection (A)(1), which allows for the making of copies and adaptations provided that "such a new copy or adaptation is created as an essential step in the utilization of the computer program" (17 U.S.C. § 117[A](1)).

The "essential step" arguments demonstrate how the requirements of a technology and the practices of its use are often inseparable, even when the law privileges the former. Originally, CONTU wrote subsection (A)(1) to accommodate the reality of how computer memory works. Even just loading a piece of software onto a computer requires making a copy. Computers do not physically remove the programming from the disk, CD, or server from which it accesses the software; rather, they copy the code from the source onto the computer's own memory. Because putting software in copyright's purview would prohibit

people from making copies, and because making copies is a fundamental part of how software runs, Section 117's drafters included a subsection specifically to exempt these functions from copyright law, thus protecting computer users from infringing copyright every time they ran a program.

For those seeking this exemption for car repair and modification, the particular language of subsection(A)(1) made it a flimsy defense. It is necessary to make copies in order to make repairs or modifications: to repair or modify a car, the original software often needs to be copied from the vehicle's ECU onto a separate computer, where the mechanic makes the necessary changes to the software, and then "reflashes" (meaning to rewrite the programming on) the new code back onto the ECU after they're done. However, the language says these actions must be *an essential step in the utilization* of the computer program. Are repairs or modifications essential steps in using car software?

The EFF (2015b) acknowledged that many of the activities that this exemption would allow were "not essential to using the vehicle software for routine driving purposes" (p. 10). However, they noted that when CONTU recommended adding Section 117, they made it clear that its language was intended to cover the addition of new features to existing programs (p. 10). The EFF (2015a) also detailed how the courts, acknowledging this intention, had already allowed that 'a copy made for the express purpose of adding new features and capabilities that do not implicate a copyright holder's rights qualifies as an essential step' as far as Section 117 protections are concerned (p. 15).

In this way, CONTU indicated that they understood that software users might need to make modifications to that software in order to make it interoperable with their specific machine, and that this could be considered an essential step in the use of a program. They noted that, due to the lack of standardization in the computer industry, rightful possessors of a copy of a program may need to adapt it in order to use it, and thus "a right to make those changes necessary to enable the use for which it was both sold and purchased should be provided" (National Commission on New Technological Uses of Copyrighted Works, 1978: 13). As such, the courts would need to understand the uses for which people are buying a piece of programming. In the 2015 exemptions proceedings, groups representing car owners made it clear that the ability to add features, repair, or maintain your own car are uses people expect when they buy one. The American Automobile Association (AAA) (2015), for example, saw tinkering as an indispensable aspect of car ownership, writing that '[v]ehicles are not "computing devices" to AAA's members,' and that a prohibition on the ability to tinker with their cars would "overturn long-standing fundamental expectations of car ownership" (p. 1).

Opponents asserted, quite firmly, that the activities described by proponents were not "essential steps" to using an automobile (Association of Global Automakers, 2015: 6). However, they provided no evidence to the contrary, arguing that proponents had not made a strong enough case themselves. Because the burden of proof is on those seeking the exemption, opponents did not need to provide evidence. Still, this counterargument belies a surprising disregard for the enormous automotive aftermarket that relies on the ability to make parts interoperable, and that in turn supports the OEM market.[1] If tinkering with your car is not an important part of owning it, then why do most major OEMs support the third-party aftermarket through partnerships, joint marketing campaigns, attendance at aftermarket conventions, and so on?

Establishing adverse effects

Exemption proponents not only had to argue that the uses for which people would circumvent TPMs were non-infringing, but also that not allowing this circumvention would cause an adverse impact. The LOC emphasized the need to show likelihood, not plausibility, meaning that the proponent "must prove by a preponderance of evidence that the harm alleged is more likely than not" (US Copyright Office, 2014: 55689). However, the text of the law provides little guidance on what evidence is considered sufficient for establishing an adverse impact, thus requiring proponents to argue that the harms they have identified are both real and worthy of being addressed (Perzanowski, 2007: 7). Furthermore, the Copyright Register required proponents to persuade them that the impact of the circumvention prohibition on a class of works was not a mere inconvenience or isolated harm, but indeed a substantial adverse effect (Perzanowski, 2007: 7). If alternatives exist that provide access without circumventing the TPMs, even if those alternatives cost additional money, then the Copyright Office frequently rejects claims of adverse effects.

In the case of Class 21, proponents primarily framed the adverse effects as a blow to individuals' income prospects. The EFF (2015b) argued that this prohibition was harming people's ability to make a living: "The freedom to reverse engineer vehicle software is essential to the livelihood of thousands of Americans" (p. 20). For USC IPT, focusing specifically on farmers' concerns, these economic considerations were critical. The inability to do their own repairs or modifications was impacting farmers' ability to fix their equipment in a timely fashion, use the repair shop of their choice, or take steps to prevent damage to their equipment—all of which could incur significant financial losses, especially given the time-sensitive nature of much farm work. This framing is in line with the LOC's (and US law in general's) tendency to see the value of copyright in economic terms; that is, copyright's impact is more relevant to the courts when it can be seen in dollar amounts (Arewa, 2006; Sinnreich, 2019: 99).

At other points, the adverse impact was as much about specific practices as it was about the very principles behind vehicle ownership. For iFixit and its founder, Kyle Wiens, repair and modification are cultural practices that are fundamental to farming and car ownership in America. Wiens specifically discussed the provision's impact on farmers, noting that the proprietariness of modern farming equipment posed a challenge to farmers "fiercely independent" nature. iFixit's comments focused on car owners interested in modifying their cars "[t]o make the car faster. Or more fuel efficient. Or more powerful," not because they're trying to save money, but because '[t]hey can't resist' the urge to tinker. Granting the exemption was about protecting car owners "enjoyment" and "spirit of exploration" (iFixit, 2015: 2). The EFF referenced specific communities who were affected by the ban, such as ecomodders and hypermilers who tweak the software for increased fuel efficiency, and people who adjust their cars to function more efficiently at high altitudes. They also argued that adverse effects are not just about impeding working on engines for interoperability, but also working on engines for fun (Electronic Frontier Foundation, 2015a: 22). By highlighting that activities are groups like ecomodders and hypermilers, whose modifications tend to be environmentally friendly, the EFF begins to gesture here to the idea that our ability to modify our devices has implications beyond the individual owner. However, the turn to "fun" can be

problematic, premised as it is on the individual's enjoyment of an activity, regardless of the broader impact of that activity. Even the reference to farmers frames the adverse reaction as about farmers' personal natures, rather than societal benefit. It suggests that individual freedom is the priority, and any benefits to society are secondary.

In their rebuttals, opponents either ignored or reframed cultural considerations as economic concerns. Primarily, they argued that these claimed adverse impacts did not exist because alternatives to circumvention exist and are "readily available," as a result of the Memorandum of Understanding (MOU) signed by auto manufacturers in 2014.[2] This MOU included a "Right to Repair" agreement in which all signatories agreed to provide access to diagnostic and repair information to owners and independent repair facilities upon "fair and reasonable terms" (Memorandum of Understanding: R2R Agreement, 2014). They did not address whether these terms were actually financially feasible for independent shops or individual owners. Moreover, General Motors argued, there are not enough people who would make use of this exemption. Although they acknowledged the researchers, hobbyists, blogs, and message boards that the EFF had cited, these communities are too small to support the argument that the prohibition has " 'distinct, verifiable, and measurable impacts' occurring in the marketplace" (General Motors, 2015: 20). For opponents, any impacts of the provision are only valid insofar as they could be quantified in monetary terms.

Balancing the public interest and private rights

The language of Section 1201 allows the Copyright Office to consider other issues that might fall outside the specific requirements listed. Opponents of the Class 21 exemption used this prompt to argue for applying copyright beyond its conventional domain of incentivizing authorship, attempting to turn it instead into a tool for protecting public safety and environmental standards. After responding to all the proponents' arguments, opponents almost universally turned to a final argument: that regardless of whether car owners also owned a copy of the software, or whether their uses of that software were essential and noninfringing, or whether the protections in place were in fact harming any legitimate uses, at the end of the day those TPMs must remain uncircumvented for the good of public safety and environmental protection.

One approach opponents took was to define the "essential" part of the "essential step" in terms of what could be considered more "essential" for the general good, rather than what is "essential" for individual uses. General Motors pointed out that the courts in *Krause* had said that adding new features and capabilities could be considered an essential step because those modifications made the software "helpful or worth using" (*Krause v. Titleserv Inc III*, 2005, quoted by General Motors, 2015: 13). However, the implications the exemption had for safety, security, and regulatory compliance "has the opposite effect from making the software helpful or worth using" (General Motors, 2015: 13).

To an extent, here the opponents were asking compelling questions—how *do* we balance individual ownership rights against the needs of the public, especially where those ownership rights might be used to engage in activities that harm the public? However, proponents argued, copyright law was never meant to do that work. Maintaining safety, security, and environmental standards was the purview of other agencies and other

regulations—in fact, most of the modifications that opponents were concerned might happen were already illegal under existing laws. As the AAA (2015) put it, while the ability to make a car go faster may not have been the kind of exemption the DMCA's authors imagined the law would have to grapple with, "preventing a car from going faster has nothing whatever to do with copyright or DMCA protection" (p. 3).

The Register of Copyright's recommendations

After reviewing the arguments, the Register of Copyrights (2015) issued its recommendations to the Copyright Office, in which it concluded that "the overall record supports proponents" claim that reproducing and altering the computer programs on ECUs for purposes of facilitating diagnosis, repair and modification of vehicles may constitute a non-infringing activity . . . under the exception set forth in section 117' (p. 234). Proponents had satisfied all the requirements of the exemption process: they had established that car owners are owners of a copy of the software on their vehicles; that the reproduction and alteration of that software was an essential step for its use; and that prohibiting these activities was having significant adverse effects on lawful activities.

Regarding the first requirement, the Register remarked that the office had, in the past, noted that existing case law governing the determination of ownership of a copy of a computer program was "inconsistent" (2015: 237, quoting Register of Copyrights, 2012: 92). In spite of this, and lacking any new case law clarifying those inconsistencies, the Register found that when it applied the tests from case precedent, proponents' arguments supported the conclusion that vehicle owners own their copy of the vehicle engine control computer programs (Register of Copyrights, 2015: 238).

For the second, the Register agreed that "reproduction and alteration of ECU computer programs are very often an 'essential step' in the process of vehicle diagnosis, repair and modification," a statement that, interestingly, seems to acknowledge that diagnosis, repair, and modification are important aspects of utilizing a vehicle. It found that the uses proponents described were consistent with CONTU's stated intentions for Section 117, namely "the right to add features to the program that were not present at the time of rightful acquisition" (Register of Copyrights, 2015: 238, quoting National Commission on New Technological Uses of Copyrighted Works, 1978: 13); furthermore, that *Krause* supported the addition of new features not just to keep the program functional, but to "improve functionality" (Register of Copyrights, 2015: 239, quoting *Krause v. Titleserv Inc III*, 2005: 126).

With regards to the third question of adverse effects, the Register was persuaded by the examples proponents provided of how lawful diagnosis, repair, and modification activities were impeded by the TPMs on automotive software. The Register agreed that although manufacturer-licensed tools or services may exist, their cost and timeliness had a significant impact on their actual accessibility. In addition, often such tools are not available for older models, capable of diagnosing certain unusual malfunctions, or useful for making more unorthodox (though still legal) modifications.

However, the Register was stymied by opponents' final argument, which was how to balance car owners' rights to circumvent TPMs with other government agencies' interests in protecting vehicle safety, regulating vehicle emissions, and promoting cybersecurity.

The Register noted the concerns expressed by the Department of Transportation (DoT), the Environmental Protection Agency (EPA), and the California Air Resources Board (CARB), who had submitted letters detailing their reservations about the exemption. To accommodate these concerns, the Register, for the first time in the history of the exemptions process, suggested a 12 month delay to allow other agencies to respond to the exemption. However, the delay wound up being inconsequential. None of the agencies listed in the Register's report released new rules or policies to specifically accommodate the exemption, and so after 12 months, it went into effect with no fanfare.

The delay notwithstanding, it seemed that the exemption's advocates were victorious. However, I suggest that activists fighting against corporate control over consumer devices could discover a better way forward by the considering the narrowness of their victory. To begin, the Register was careful to word the exemption such that only the owner of the vehicle could use it; they were concerned that allowing third parties to undertake the repairs or modifications would implicate the DMCA's firm prohibition against the trafficking of circumvention tools or services. That is, even though the Register (2015) was "sympathetic to the practical issues that may arise if vehicle owners do not have the knowledge or ability to circumvent TPMs themselves," they were hamstrung by the language of the law (p. 246). The exemption may have been granted, but only the most technologically capable car owners would be able to take advantage of it; as such, a few individuals may benefit from this exemption, but the community as a whole remained at a loss.

What's more, in their letters to the Register, the EPA and CARB both noted that granting the exemption would remove one of the tools the agencies relied on to discourage tampering with car engines to bypass emissions standards. While the Register maintained that they could not extend copyright so far as to do the work of emissions standards laws, I remain troubled by how easy it is to draw the connection between individual autonomy as the defense against corporate control and individual autonomy as the defense against government regulation—if what matters most is that I can do what I want with my property, then why must I abide by emissions standards? The answer is because we, as a society, have agreed that there must be some limits to individual autonomy in order to serve community interests. Perhaps, then, we can find a more sustainable argument against corporate control by turning not to individual autonomy, but instead to ideas of communalism and sustainability.

What is "essential" about ownership?

Many scholars have argued that Section 1201 of the DMCA should not be considered a copyright law, as it functionally criminalizes decryption, even when that decryption would be non-infringing (Cohen, 2012; Gillespie, 2009; Sinnreich, 2019). Thus, the exemptions built into copyright law do not necessarily protect against the criminal charges brought under the DMCA, allowing "copyright" law to be leveraged for non-copyright purposes. In spite of this, the parties advocating for the exemption for car software still had to prove their activities would be non-infringing, which required engaging with the laws at the heart of the software copyrightability. My analysis reveals not only the cracks in the DMCA, but in how copyright is used to protect software in the

first place. The 2015 cycle contained some unresolved tensions in how the exemption process in particular, but also the US legal system in general, attempts to strike the balance of copyright.

On the one hand, these proceedings reproduce the problematic interpretation of copyright as primarily a tool for protecting profits. Predictably, opponents to the exemption—all of whom were vehicle or vehicle parts manufacturers, or organizations that represented them—relied heavily on the argument that granting the exemption would impact their bottom line. Of course, this interpretation is not new or unexpected; the financial needs of authors has been part of the purpose of copyright since the beginning. James Madison, who introduced the issue of copyright to the Constitutional Convention, championed it as a way of protecting individual authors' livelihoods while protecting the public interest in the free circulation of ideas, by providing an economic incentive to continue creating new works, while limiting the protections to ensure a thriving public sphere (Vaidhyanathan, 2003). Others in the Constitutional Convention, including Thomas Jefferson, were wary of copyright, concerned that, in spite of the limitations placed on the exclusive rights that copyright would grant, eventually it would be used to consolidate power (Vaidhyanathan, 2003: 22). The arguments used by the exemption opponents in this case study seem to bear out Jefferson's fears: that copyright would eventually be interpreted to function first and foremost as a mechanism for protecting profits. During the exemption debates, corporations fought to protect their profits, but never directly justified doing so by explaining that those profits were necessary for them to continue investing in the development of new devices that would promote the advancement of technology. It would seem that corporations' interpretation of the public good incentive argument—that by providing copyright, Congress encourages innovation—is so tied to a particular kind of economic value that they didn't bother with explaining how their profits are tied to this promotion of the public good. This in turn facilitated the paternalistic argument made by opponents that framed the public interest as best served by technologically, legally, and corporately enforced compliance with governmental regulation.

On the other hand, the vision put forward by advocates of the public good as best served by individual liberty comes with its own problematic assumptions and establishes its own troubling precedent. The issue here is not whether either of these private interests –providing exclusive rights to allow authors to profit off their works or individual liberty—can ever serve the public good; there are compelling arguments that they can and do, to a point (Samuelson, 2010). Rather, what this analysis reveals is that, as currently written and interpreted, copyright law seems to artificially put these visions at odds, creating a false dichotomy that constricts the possible terms of the debate over copyright's scope and applicability. This forecloses the consideration of other possibilities for balancing incentives with access, such as a vision of copyright where the public good includes more non-economic values, that thinks beyond "innovation" as the mark of a successful IP regime. Insofar as copyright has been imagined as protecting private interests in the service of the public good, the private interests in question were always that of the original author, and the public good that of "promoting the Progress of Science and useful Arts" by encouraging the creation and distribution of new works (US Const. Art I, § 8, Clause 8; although the validity of this interpretation is up for debate, see Cohen, 2012). US copyright law has long acknowledged that the interests of consumers of

creative works must also be considered, so consumers could one day become authors themselves; this exemptions process is, in theory, an example of that. As Cohen (2012), Petersen (2015), Coleman (2012), Benkler (2006), and others have noted, these conceptualizations of the public good, as justifications for copyright as well as its exemptions, still rely on the concepts of the individual author and economic incentives being the ultimate driving forces behind progress, and while these conceptualizations have been suspect from the start, digital technologies are hastening the moment of reckoning.[3]

What this suggests, then, is that the Section 1201 exemption process, and the perhaps copyright law itself, particularly as it applies to software, is fundamentally incomplete and conceptually foreclosed. As written, administrative law forces the Copyright Office to interpret Section 1201 by relying heavily on case precedent and legal argumentation, both of which are hamstrung by long-standing biases within copyright law toward economic interests over cultural or societal considerations. What's more, case precedent is lacking in guidance for the kinds of questions that ubiquitous computing devices pose to copyright. The case precedent that the LOC relied on during its deliberations—*Krause* and *Vernor*—both concerned software that runs on computers. But as we have seen, devices like cars, which have long been a part of American daily life but have only recently been embedded with software, come with different expectations of use and of ownership, and with different consequences for misuse and poor stewardship. What is needed, at the very least, is a revision of the DMCA that accepts evidence of utility and harm that extend beyond individualistic or economic considerations into how a given exemption could benefit communities or the environment over time. However, these revisions would be a stop-gap measure in a more important, but ambitious, project: to accept the challenge that software-embedded devices have revealed to us and radically reorient the purpose, application, and ideological underpinnings of copyright toward a more sustainable and communal future.

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Notes

1. The automotive aftermarket refers to the industry that manufactures, sells, and installs any parts, chemicals, equipment, or accessories for cars that do not come from the OEMs and are installed on a car after it is purchased.
2. In 2012, Massachusetts passed the "Right to Repair" Initiative, which required OEMs to provide vehicle owners and independent repair facilities with access to the same diagnostic and repair information they provide their authorized dealers and repair facilities. Worried that other states would follow, the Alliance of Automobile Manufacturers and the Association of Global Automakers signed an agreement to apply the Massachusetts' law's requirements nationally. On the one hand, this move made strategic sense; heading off other state laws also meant avoiding the possibility of different state requirements, making compliance a

headache. On the other hand, some critics were concerned about the self-regulatory nature of the MOU—if a carmaker violated the agreement, the issue would go to a dispute resolution panel rather than to court. The MOU also further empowered OEMs by undermining the aftermarket industry advocacy efforts that were pushing for Right to Repair laws. In exchange for the automakers' agreeing to provide them more information, aftermarket groups agreed to stop financing and promoting such legislation (Jensen, 2014). Clearly, proponents had reason to be skeptical about promises the OEMs might make on the basis of this MOU.

3. For many, the progress of Science and the useful Arts is best measured in terms of technological innovation and economic growth; that economic growth could be interpreted as a sign that people are able to get their work done, and that impeding that work (by weakening copyright protections) would be bad for society. However, innovation-centered justifications for intellectual property still often prioritize individual innovations and innovators, an idea that many scholars of innovation and intellectual property have pushed against—(see Lemley, 2012). There is a robust, and rapidly growing, body of scholarship that has offered compelling critiques and alternatives to this vision of copyright, much of it coming from global and indigenous intellectual property scholars—(see Arewa, 2006; Sunder, 2012).

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