



UNITED STATES COPYRIGHT OFFICE

## **Long Comment Regarding a Proposed Exemption Under 17 U.S.C. § 1201**

**Although we will not be providing multimedia evidence in connection with this comment, we provide in-text hyperlinks throughout the comment (represented as blue, underlined words) that link to documentary evidence and/or some cited documents.**

### **ITEM A. COMMENTER INFORMATION**

These comments are submitted on behalf of the Motion Picture Association of America, Inc. (“MPAA”), the Entertainment Software Association (“ESA”), the Recording Industry Association of America (“RIAA”), and the Association of American Publishers (“AAP”). They are collectively referred to herein as the “Joint Creators and Copyright Owners.” They may be contacted through their counsel at Mitchell Silberberg & Knupp LLP, J. Matthew Williams, 202-355-7904, mxw@msk.com, 1818 N. Street, NW, 8th Floor, Washington, D.C. 20036.

**The Motion Picture Association of America, Inc. (“MPAA”)** is a trade association representing some of the world’s largest producers and distributors of motion pictures and other audiovisual entertainment material for viewing in theaters, on prerecorded media, over broadcast TV, cable and satellite services, and on the internet. The MPAA’s members are: Paramount Pictures Corp., Sony Pictures Entertainment Inc., Twentieth Century Fox Film Corp., Universal City Studios LLC, Walt Disney Studios Motion Pictures, and Warner Bros. Entertainment Inc.

**The Entertainment Software Association (“ESA”)** is the United States trade association serving companies that publish computer and video games for video game consoles, handheld video game devices, personal computers, and the internet. It represents nearly all of the major video game publishers and major video game platform providers in the United States.

**The Recording Industry Association of America (“RIAA”)** is the trade organization that supports and promotes the creative and financial vitality of the major music companies. Its members are the music labels that comprise the most vibrant record industry in the world. RIAA members create, manufacture and/or distribute approximately 85% of all recorded music produced in the United States.

**The Association of American Publishers (“AAP”)** represents the leading book, journal, and education publishers in the United States on matters of law and policy, advocating for outcomes that incentivize the publication of creative expression, professional content, and learning solutions. As essential participants in local markets and the global economy, our members invest in and inspire the exchange of ideas, transforming the world we live in one word at a time.

The Joint Creators and Copyright Owners all rely on technological protection measures to offer innovative products and licensed access to consumers. Access controls make it possible (i) for consumers to enjoy recorded music through subscription services like SiriusXM, Spotify, Amazon Music Unlimited, YouTube Red, Apple Music and Pandora, including on mobile devices, through in-home voice assistants, and in their vehicles; (ii) for consumers to view motion pictures at home or on the go via discs, downloadable copies, digital rental options, cloud storage platforms, TV Everywhere, video game consoles, and subscription streaming services; (iii) for consumers to play their favorite video games on consoles, computers, and mobile devices; and (iv) for consumers to enjoy and learn from books, journals, poems and stories (including through subscription, lending, and rental options) on dedicated e-book readers, such as the Kindle and the Nook, on tablets and smartphones, and via personal computers. As the Register concluded in the recent Section 1201 Study, “[t]he dramatic growth of streaming

services like Netflix, Spotify, Hulu, and many others suggests that for both copyright owners and consumers, the offering of access—whether through subscriptions, *à la carte* purchases, or ad-supported services—has become a preferred method of delivering copyrighted content. . . .

[T]he law should continue to foster the development of such models.” U.S. Copyright Office, [Section 1201 of Title 17: A Report of the Register of Copyrights](#) 45-46 (2017) (“1201 Study”).

## **ITEM B. PROPOSED CLASS ADDRESSED**

Proposed Class 6: Computer Programs - Jailbreaking

## **ITEM C. OVERVIEW**

The Joint Creators and Copyright Owners did not oppose renewal of the existing “jailbreaking” exemption for “smartphones and portable all-purpose mobile computing devices.”<sup>1</sup> However, they oppose the expansions requested by the Electronic Frontier Foundation (“EFF”).

First, EFF’s September 13, 2017 petition requested that the exemption be revised to cover “*general-purpose portable computing devices*,” rather than “*portable all-purpose mobile computing devices*.”<sup>2</sup> EFF, [Class 6 Petition](#) at 2 (Sept. 13, 2017) (“EFF 2017 Petition”) (emphasis added). EFF did not provide an adequate explanation of the distinction between “general-purpose” and “all-purpose” devices, or justify omitting the term “mobile” from the exemption. Regardless, EFF has apparently abandoned this request in its December 18, 2017 comments and reverted to the “all-purpose” language. EFF, *et al.*, [Class 6 Long Comment](#) at 2

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<sup>1</sup> Although the term “jailbreaking” is loaded with meaning that the Joint Creators and Copyright Owners do not endorse, the Copyright Office has adopted the term so these comments will use it.

<sup>2</sup> EFF also sought “to enable or disable hardware features” in addition to software features, but said little about what this would allow. Without more information, the Joint Creators and Copyright Owners cannot determine whether to oppose this expansion. The Register should obtain much more specific information from EFF before expanding the exemption in this manner.

(Dec. 18, 2017) (“EFF 2017 Comment”). The Register should therefore decline to recommend that the Librarian grant the prior proposal.<sup>3</sup>

Second, the Register should decline to recommend the expanded exemption proposed in EFF’s December 18, 2017 comments because it was untimely. As discussed above, EFF’s initial petition proposed an exemption that was limited to *portable* devices. EFF’s December comments (now joined by Owners’ Rights Initiative and the Association of Service and Computer Dealers International, Inc.), however, focus almost exclusively on non-portable, in-home or in-office, voice assistants. The Copyright Office was clear in the Notice of Inquiry that petitions must clearly describe the exemptions that proponents are seeking. [\*Exemptions To Permit Circumvention of Access Controls on Copyrighted Works, Notice of Inquiry and Request for Petitions\*](#), 82 Fed. Reg. 29,804, 29,807 (Jun. 30, 2017) (“NOI”). EFF’s attempt to reimagine its initial request is procedurally improper.

Third, EFF’s definition of “voice assistants” is overbroad. Although EFF stated that it does not intend for the exemption to cover television set-top boxes, for example, the definition proffered by EFF would not necessarily exclude such devices. Many devices receive voice commands and access multiple forms of content, including subscription television set-top boxes. For the Register to recommend an exemption, EFF needed to articulate a definition that was properly tailored.

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<sup>3</sup> The record shows little support for the requested expansion. Only two commenters (Consumer’s Union and Free Software Foundation) supported EFF’s proposal. Neither submitted any evidence in support. FSF submitted 163 purported “signatures” with its comments. However, FSF submitted the exact same names with the comments it filed for every class of works it supported, indicating the signatories endorse FSF’s anti-access control philosophy, rather than the specific individual proposed classes. In addition, most of the “signatures” came from outside the United States.

Fourth, voice assistants are rapidly becoming an important platform through which consumers enjoy expressive works, including music, literary works, and audiovisual works. EFF's claims that jailbreaking these devices will not put such works at risk of unlawful access are unsubstantiated.

Fifth, jailbreaking voice assistants would enable installation of applications that enable unauthorized access to copyrighted works. Although EFF's proposal is limited to "lawfully acquired applications," if recommended in some form, it should also be limited to applications that do not *enable unauthorized access*.

Finally, EFF has not established that alternatives to circumvention are unavailable or that lawful uses are likely to be adversely affected in a substantial manner during the next three years. EFF admits that manufacturers of voice assistants already allow app development by independent developers. EFF 2017 Comment at 5. There is significant competition in the marketplace. Consumers can choose whether they prefer a voice assistant that allows independent development, or not.

#### **ITEM D. TECHNOLOGICAL PROTECTION MEASURE(S) AND METHOD(S) OF CIRCUMVENTION**

With respect to EFF's initial proposal to expand the exemption to cover "general-purpose portable computing devices," rather than "portable all-purpose mobile computing devices," it is unclear which access controls are at issue. EFF defined "general-purpose portable computing devices" to include all devices "characterized by their sale through retail channels, their portability, their use of general purpose operating systems . . . , and their utility for a wide variety of computing tasks." EFF 2017 Petition at 3. EFF described the access controls as follows: "bootloader access controls that restrict the loading of alternative or modified operating systems, and operating system access controls that prevent the installation or removal of

application software or prevent user control of hardware features such as a camera, microphone, or network connection.” *Id.*

With respect to EFF’s untimely proposal related to in-home or in-office voice assistants, the access controls at issue appear to be any technological measure that inhibits the installation of software, the removal of software, the addition of “hardware features,” or the removal of hardware features, on voice assistants. It is unclear from EFF’s comments whether all barriers to engaging in these activities are actually access controls. *See, e.g., Clinton et al., [A Survey of Various Methods for Analyzing the Amazon Echo](#)* (figure 5). EFF described “hardware features” as including “microphones, cameras, and wireless interfaces.” EFF 2017 Comment at 17. EFF says almost nothing else about this requested alteration of the existing exemption.

#### **ITEM E. ASSERTED ADVERSE EFFECTS ON NONINFRINGING USES**

The current regulations exempt the following class of works:

Computer programs that enable smartphones and portable all-purpose mobile computing devices to execute lawfully obtained software applications, where circumvention is accomplished for the sole purpose of enabling interoperability of such applications with computer programs on the smartphone or device, or to permit removal of software from the smartphone or device. For purposes of this exemption, a ‘portable all-purpose mobile computing device’ is a device that is primarily designed to run a wide variety of programs rather than for consumption of a particular type of media content, is equipped with an operating system primarily designed for mobile use, and is intended to be carried or worn by an individual.

37 C.F.R. § 201.40(4).<sup>4</sup>

EFF’s *petition* proposed expanding the exemption as follows:

Computer programs that enable smartphones and general-purpose portable computing devices to execute lawfully obtained software applications, where

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<sup>4</sup> The regulations also exempt: “Computer programs that enable smart televisions to execute lawfully obtained software applications, where circumvention is accomplished for the sole purpose of enabling interoperability of such applications with computer programs on the smart television.” 37 C.F.R. § 201.40(5).

circumvention is accomplished solely for one or more of the following purposes: to enable interoperability of such applications with computer programs on the smartphone or device, to enable or disable hardware features of the smartphone or device, or to permit removal of software from the smartphone or device. For purposes of this exemption, a “general-purpose portable computing device” is a portable device that is primarily designed or primarily used to run a wide variety of programs rather than for consumption of a particular type of media content, is equipped with an operating system primarily designed for use in a general purpose computing device, and is primarily designed to be carried or worn by an individual or used in a home.

EFF 2017 Petition at 2.

EFF’s *comments* proposed expanding the exemption as follows:

Computer programs that enable smartphones, **voice assistant devices**, and portable all-purpose mobile computing devices to execute lawfully obtained software applications, where circumvention is accomplished **solely for one or more of the following purposes**: enabling interoperability of such applications with computer programs on the smartphone or device, or to permit removal of software from the smartphone or device, **or to enable or disable hardware features of the smartphone or device**. For purposes of this exemption, a “portable all-purpose mobile computing device” is a device that is primarily designed to run a wide variety of programs rather than for consumption of a particular type of media content, is equipped with an operating system primarily designed for mobile use, and is intended to be carried or worn by an individual. **A “voice assistant device” is a device that is primarily designed to run a wide variety of programs rather than for consumption of a particular type of media content, is designed to take user input primarily by voice, and is designed to be installed in a home or office.**

EFF 2017 Comment at 2 (bold in original).

**1. The Request To Cover “General Purpose Portable Computing Devices” Is Unsupported.**

In 2015, the Register recommended expanding the jailbreaking exemption beyond smartphones to cover circumvention to access “computer programs that enable all-purpose mobile computing devices to execute lawfully obtained software applications.” 37 C.F.R. § 201.40(4). The Register concluded that the regulations could adequately distinguish between mobile devices and other devices, including laptop computers, based on the operating systems

installed on the devices. However, the Register emphasized that the scope of any jailbreaking exemption must be “meaningfully defined.” [\*Exemptions To Permit Circumvention of Access Controls on Copyrighted Works: Notice of Proposed Rulemaking\*](#), 82 Fed. Reg. 49,550, 49,561 (Oct. 26, 2017) (“NPRM”); U.S. Copyright Office, [\*Section 1201 Rulemaking: Sixth Triennial Proceeding to Determine Exemptions to the Prohibition on Circumvention: Recommendation of the Register of Copyrights\*](#) 189 (2015) (“2015 Rec.”).

EFF’s September 13, 2017 petition proposed altering the regulatory language to cover “general-purpose portable computing devices” rather than “portable all-purpose mobile computing devices.” EFF 2017 Petition at 2. EFF claimed that this new class of works could be meaningfully defined because the devices could be “characterized by their sale through retail channels, their portability, their use of general purpose operating systems . . . , and their utility for a wide variety of computing tasks.” *Id.* at 3. EFF did not explain the significance of omitting the term “mobile” from the exemption or explain how to distinguish between “general-purpose” devices and “all-purpose” devices.

In response to the NPRM, EFF apparently abandoned its proposed exemption. EFF submitted no facts or argument in favor of altering the regulatory language to cover “general-purpose portable computing devices.” Two other proponents submitted comments in favor of EFF’s petition. However, neither Consumers Union nor Free Software Foundation (“FSF”) submitted anything beyond general statements regarding their philosophical views on copyright law.<sup>5</sup> Such comments cannot adequately support recommending an exemption. *See* NPRM at

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<sup>5</sup> FSF proposed expanding the exemption to cover *all* devices, rather than supporting EFF’s proposed class. FSF’s expanded proposal should be rejected as untimely. In addition, the Register has previously rejected such unbounded proposals on the merits. *See* 2015 Rec. at 192; U.S. Copyright Office, [\*Section 1201 Rulemaking: Fifth Triennial Proceeding to Determine\*](#)

49,558 (“[T]he Office favors specific, ‘real world’ examples supported by evidence over speculative, hypothetical observations.”)

Given that the proponents have not met their burden to justify expanding the exemption as requested in the initial petition, the Register should decline to recommend the proposed class of works.<sup>6</sup>

## **2. The Request To Cover Non-Portable Devices Is Untimely.**

The NOI stated clearly that new petitions, including requests for expansions of existing exemptions, were due by September 13, 2017. NOI at 29,804 (“Written petitions for new exemptions must be received no later than 11:59 p.m. Eastern Time on September 13, 2017.”).

Although the NOI noted that “proponents will have the opportunity to further refine or expound upon their initial petitions during later phases of the rulemaking[.]” it also stated that petitioners should “adequately describe in plain terms” their proposed exemptions. *Id.* at 29,807. In its *comments*, EFF proposed something very different than what it requested in its *petition*.

Whereas EFF previously sought an exemption limited to “portable” devices, it now seeks an exemption applicable to devices that EFF admits are “small appliances designed to sit on a desk or tabletop.” EFF 2017 Comment at 4. Unless by “portable” EFF meant to refer to anything that is capable of being moved (which would have been an almost meaningless limitation), voice assistants, as described in EFF’s comments, are outside the scope of the proposed class of works at issue. Allowing such substantial, late changes to proposals would render the NOI’s responsive

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[Exemptions to the Prohibition on Circumvention: Recommendation of the Register of Copyrights 63 \(2012\) \(“2012 Rec.”\)](#).

<sup>6</sup> As discussed in more detail in the comments submitted by ESA, which the Joint Creators and Copyright Owners endorse, the proponents certainly have not met their burden to justify including video game consoles within the scope of any expanded exemption. As the Register has previously concluded, jailbreaking consoles does not qualify as fair use and undermines copyright protections for video games and other works accessible via consoles.

deadline meaningless and would invite future abuse of the system whereby exemption opponents will be deprived of adequate time to prepare oppositions – something of which the current schedule already provides them precious little. Any expanded exemption considered by the Register should be limited to portable devices.

### **3. EFF’s Definition Of “Voice Assistant” Is Overbroad.**

EFF defines a “voice assistant” as any “device that is primarily designed to run a wide variety of programs rather than for consumption of a particular type of media content, is designed to take user input primarily by voice, and is designed to be installed in a home or office.” EFF 2017 Comment at 2. This exemption is overbroad because many devices are capable of being operated by voice and access multiple forms of content. For example, television set-top boxes frequently come equipped with remote controls that are capable of receiving voice commands. *E.g.*, [The X1 Voice Remote Overview](#) (“The X1 Voice Remote (models XR11 and XR15) from Xfinity is a remote control that allows you to find what you want faster by using voice commands to change channels, search for shows, get recommendations, find out what song is playing on your TV screen and more.”); Janko Roettgers, [TiVo Releases New Devices With Voice Control, May Add Alexa Support Next](#), VARIETY (Oct. 24, 2017). Set-top boxes also enable consumers to access television programming, movies, music channels, and internet content. Blu-ray players also access multiple forms of content, and can be operated using voice operated universal remote controls. *E.g.*, [Logitech - Harmony Elite Universal Remote](#). Indeed, as voice command technology continues to improve, nearly all devices may be capable of receiving voice commands. *See* Mark Samuels, [Siri, Cortana, Alexa and Google Assistant are just the beginning: Voice is the future](#), ZDNET (July 25, 2017).

EFF intended to define voice assistants in a manner that distinguished them from set-top boxes, video game consoles, Blu-ray players, and other devices, by limiting the proposed class to devices “designed to take user input primarily by voice,” EFF 2017 Comment at 2, but whether a device is designed with such intent is a matter of subjective perspective. EFF had the burden of proffering a definition that will “meaningfully define” the class of works without sweeping in unintended devices. NPRM at 49,561. It did not meet its burden.

#### **4. Voice Assistants Access Entertainment Platforms That Could Be Put At Risk.**

Even if EFF proffers a definition that excludes set-top boxes, Blu-ray players, video game consoles, and other devices, the requested exemption could enable infringement of expressive works. As EFF emphasizes, voice assistants are used to access subscription content services, such as Spotify, Amazon Music Unlimited, YouTube Red, Apple Music, Pandora, and SiriusXM. EFF 2017 Comment at 4-5. Moreover, voice assistants are designed to [access ebooks](#) and interoperate with other devices, including set-top boxes. *See* Roettgers, *supra*. Accordingly, hacking voice assistant firmware to install unauthorized software could potentially undermine the security of subscription entertainment and publishing offerings.

EFF asserts, but does not try to demonstrate, that infringement of entertainment or publishing content will not be facilitated by the circumvention of access controls on voice assistants. EFF claims that “[j]ailbreaking voice assistant devices will not contribute to infringement of copyrighted entertainment media” because content is only stored on the devices in cache and because “[t]o the extent that audio streams are protected by digital rights management (“DRM”), such DRM is separate from the access controls in the bootloader and OS.” EFF 2017 Comment at 15. EFF provides no testimony to support this assertion, however. *See* 2015 Rec. at 193 (noting failure of proponent to provide evidence that piracy on e-book

readers would not be enabled by jailbreaking). In addition, EFF says nothing of whether content stored in cache could be copied or rendered accessible once the voice assistant firmware is hacked.<sup>7</sup>

It appears likely that EFF's assurances are overbroad. *See generally* Exhibit 1, Written Statement of Christopher Bell, VP, Technology & Anti-Piracy, Business Development, Warner Music Group. To authenticate consumer accounts and authorized access levels, devices, such as voice assistants, generally depend on some means of key/token distribution or sharing. *Id.* ¶ 5. In other words, the service must share with the device information regarding how the service identifies the consumer and what content the consumer is entitled to receive. *Id.* Obtaining root access to the firmware on a voice assistant could lead to a compromise of these protection schemes that would otherwise not be technologically feasible. *Id.* This could enable a person to avoid limitations imposed by a service provider on the number of devices through which one subscription account may be accessed. *Id.* ¶ 8. That could result in multiple consumers sharing accounts in ways that are inconsistent with the service's terms of use and that would otherwise not be technologically feasible. *Id.* Moreover, a person with root access to the firmware could likely attach a peripheral device and obtain permanent copies of sound recordings that the consumer only paid to access via a temporary subscription. *Id.* ¶ 7. The person might also be able to store these copies on the voice assistant itself, but that would depend on the amount of storage space available. *Id.* Such downloading could be accomplished very quickly, resulting in large numbers of recordings being obtained faster than a person could listen to them in real time. *Id.*

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<sup>7</sup> EFF expressly states that “the proposed expansion does not reach streaming music DRM.” EFF 2017 Comment at 15. Accordingly, if any exemption is recommended, circumvention that results in unauthorized access to music, or audiovisual works, should be expressly excluded from its scope.

EFF's claim that entertainment services would not be impacted by jailbreaking is also called into question by one of the supportive statements submitted with EFF's comments. Todd Troxell stated that he wants to create an app to "filter curse words from all applications." EFF 2017 Comment, Exhibit A. This implies that jailbreaking will enable Mr. Troxell to impact content delivery from subscription music, television, e-book, and streaming services. It also highlights that app developers could develop applications that create unauthorized derivative works or interfere with metadata that enables streaming services to identify and locate content for consumers.

**5. Applications That Enable Unauthorized Access To Expressive Works Could Be Installed On Voice Assistants Under EFF's Proposal.<sup>8</sup>**

EFF's proposal is limited to installing "lawfully obtained software applications." However, it is not limited to cover only installation of applications that *lawfully access content*. Installation of applications designed to enable access to infringing copies and transmissions of expressive works undermines the value of those works and results, ultimately, in diminished creative output. Such applications continue to cause significant harm to the entertainment industries. *See, e.g.,* IFPI, [Music Consumer Insight Report 2017](#) at 3 (40% of consumers across thirteen markets access music illegally). Accordingly, if the Register recommends an exemption applicable to jailbreaking voice assistants – which she should not – the Register should expressly exclude jailbreaking that results in the installation of applications that enable unauthorized access to copyrighted works.

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<sup>8</sup> As discussed in the comments submitted by ACT - The App Association, counterfeit copies of apps could also be installed on jailbroken voice assistants. ACT - The App Association, Class 6 Long Comment (Feb. 12, 2018).

## 6. Alternatives To Circumvention Exist.

EFF concedes that Amazon and Google already allow independent app development for voice assistants. EFF 2017 Comment at 5. *See also* Taylor Martin, [50 Most Useful Alexa Skills](#) (Jan. 29, 2018) (“[W]hat has really propelled Amazon’s Alexa forward as a bonafide platform, not just intelligent software behind a few connected speakers, is the Smart Home Skill API. This allows third-party developers to create apps and tap into the power of Alexa without ever needing native support. Major brands have already jumped on the bandwagon and more are soon to follow, especially if the popularity of products like the Amazon Echo (\$145.13 at Overstock.com) continues to grow.”); [Creating a Smart Home App: Make the most of your Google Home](#). EFF’s complaint that Amazon’s design specifications sometimes prevent certain functionality, EFF 2017 Comment at 13, identifies only a “mere inconvenience” that does not justify an exemption. *Cf.* 2012 Rec. at 47 (“As the Register has frequently stated in the Section 1201 context, ‘mere inconveniences ... do not rise to the level of a substantial adverse impact’ on noninfringing uses. Those who wish to develop and play homebrew games and applications have abundant alternatives to circumvention.”) (citation omitted).

EFF claims that Apple will not allow third party development. EFF 2017 Comment at 5. However, the source EFF cites also notes that “the HomePod will sport 1GB of RAM, which probably means that Apple is future-proofing the smart speaker to be able to run third-party apps and extensions soon enough.” Oscar Raymundo, Mac World, [The HomePod needs to run third-party iOS apps. Here’s why](#) (Aug. 25, 2017). Moreover, the Apple HomePod was only made available for purchase on February 9th, 2018. EFF’s musings regarding Apple’s business plans are too speculative to support an exemption. *See* Staff of House Comm. On the Judiciary, 105th Cong., *Section-by-Section Analysis of H.R. 2281 as passed by the United States House of*

*Representatives on August 4, 1998*, at 6 (Comm. Print 1998) (“Manager’s Report”)

(determination that adverse impact on lawful uses is likely “should be based on anticipated, rather than actual, adverse impacts only in extraordinary circumstances”).

**DOCUMENTARY EVIDENCE**

The Joint Creators and Copyright Owners submit Exhibit 1, the Written Statement of Christopher Bell, VP, Technology & Anti-Piracy, Business Development, Warner Music Group. Additionally, throughout the comment, links are provided for documentary evidence.

DATE: February 12, 2018

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# **EXHIBIT 1**

**UNITED STATES COPYRIGHT OFFICE**

**Exemptions To Permit  
Circumvention of Access Controls  
On Copyrighted Works**

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**Written Statement of  
Christopher Bell, VP Technology &  
Anti-Piracy, Business Development  
Warner Music Group**

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**Docket No. 2017-10**

**Proposed Class 6**

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1. I am VP, Technology & Anti-Piracy, Business Development, for Warner Music Group (“WMG”). I have worked at WMG for 1 year and in this same technical field for 25 years. I have built software products for entertainment services, media, publishing, and communication services. I have worked with other music and media companies including Universal Music Group (“UMG”) and multiple film and television studios and have developed embedded systems for content distribution such as with AT&T/DirecTV.

2. As part of my regular job duties, I analyze technologies used to protect WMG’s copyrighted sound recordings from unauthorized copying, distribution, public performance, and access. I submit this statement to raise concerns regarding the petition of the Electronic Frontier Foundation related to “jailbreaking” voice assistants or smart speakers, such as the Amazon Echo, Google Home, and Apple HomePod.

3. Voice assistants are rapidly becoming an important part of the ecosystem through which consumers access music. Using an Echo, for example, a consumer can access music transmissions from SirisXM, Spotify, Amazon Music Unlimited, Pandora, and other services. Most of these services require subscription payments for access. Some services have regular tiers and premium tiers, such that paying a higher subscription price results in access to more music or to other benefits.

4. Although each service differs somewhat, and WMG does not have a complete view of the technical measures used by each service, subscription streaming services would typically use multiple measures to prevent unauthorized access. First, they would require a customer log-in and password to verify that a subscription has been obtained. Second, they would encrypt streams as they are delivered to the consumer. Third, they would implement controls to monitor the number of devices through which a consumer may access the service. Most services limit the total number of devices allotted to each customer to prevent account sharing beyond a single household. Fourth, they would use technical measures to delete or render inaccessible temporary downloads that expire after a set period of time or after a user's subscription expires. There are other measures involved with streaming services, but these are typical examples.

5. To authenticate consumer accounts and authorized access levels, devices, such as voice assistants, generally depend on some means of key/token distribution or sharing. In other words, the service must share with the device information regarding how the service identifies the consumer and what content the consumer is entitled to receive. Although WMG is not privy to the precise methods used to securely communicate or store such keys/token on each voice assistant, it is my opinion that obtaining root access to the firmware on a voice assistant in order to install arbitrary code to run on the device may lead to a compromise of the above referenced protection schemes that would otherwise not be technologically feasible. Even if gaining unauthorized access to music, or to the keys/tokens used to access streaming content, was not a person's goal in the first instance, it may be the inevitable consequence of rooting the device. If the boot loader is opened, it may be possible to read keys/tokens and to reverse engineer device software in ways that reveal keys/tokens and other shared secrets.

6. I understand that the Electronic Frontier Foundation asserts that “[j]ailbreaking voice assistant devices will not contribute to infringement of copyrighted entertainment media” because content is only stored on the devices in cache and because “[t]o the extent that audio streams are protected by digital rights management (‘DRM’), such DRM is separate from the access controls in the bootloader and OS.” As discussed above, I do not believe these assertions to be entirely accurate.

7. First, once a person obtains root access to the device, I believe that it is likely that person could successfully attach a peripheral device and obtain permanent copies of sound recordings that the consumer only paid to access via a temporary subscription. The person might also be able to store these copies on the voice assistant itself, but that would depend on the amount of storage space available. Such downloading could be accomplished very quickly, resulting in large numbers of recordings being obtained faster than they could be listened to in real time.

8. Second, once a person obtains root access to the device, I believe that person could potentially avoid limitations imposed by a service provider on the number of devices through which one subscription account may be accessed. This could result in multiple consumers sharing accounts in ways that are inconsistent with the service’s terms of use and that would otherwise not be technologically feasible.

9. Such sharing is analogous to so-called “MAC address spoofing.” Some internet service providers or cable television providers allow only a certain number of computers or devices to connect to the Internet or to cable signals by default. They accomplish this by “locking” the connection to the unique Media Access Control (“MAC”) addresses of computers and devices. A MAC address is a unique identifier built into modems, routers and other network hardware. To circumvent the “lock,” a person must configure a device to pretend to have the

same MAC address as an “approved” device, instead of its own address. Similarly, if a person had access to the keys/tokens by which one subscriber accessed a music streaming service, that person could pretend that its own device was an approved device, and access a service under circumstances that would otherwise be prevented by technical measures.

10. There are likely other ways that obtaining root access to voice assistants could result in unauthorized access to, or copying of, sound recordings. Given that these devices are in their infancy, much is unknown to us about the technical measures utilized by the manufacturers and the streaming service providers. Although WMG seeks to ensure that its recordings will only be accessible by consumers in manners that are consistent with the various service providers’ terms of use, we do not control every aspect of the delivery process. I consider access controls on voice assistant firmware to be one important aspect of ensuring secure delivery of content.

11. Thank you for considering these issues.



Christopher Bell

February 9, 2018

Date