

Commenter: Alexander R. Pruss, Owner, Omega Centauri Software

Class of works: 5: mobile phones and tablets, including media players such as the iPod Touch that allow installation of third-party applications

Summary of argument in favor of allowing jailbreaking:

Atypical use scenarios, including night use by amateur astronomers or security personnel, as well as accessibility concerns can require system access that needs a jailbroken device.

I am an experienced part-time mobile software developer (currently operating as Omega Centauri Software) for Android devices, and have previously developed or co-developed many applications for PalmOS devices. Currently, I am the sole developer for several Android applications: RootDim, ScreenDim, Force2SD, LunarMap, LibriVox Downloader and Buttons for Archos. I am also a co-developer of the Android PDF Viewer (APV).

Finally, I am also an amateur astronomer.

Some of the software I develop or have developed allows users to customize their devices in ways that go beyond what the manufacturer originally expected. Customization of this sort can require full system access to the application, i.e., jailbreaking.

In this submission, I would like to offer several examples from my experience where rooting Android devices does or could help users in a significant way, and end with a few general comments.

1, My most popular shareware PalmOS application was FontSmoother, which allowed users to replace the built-in system fonts with higher quality fonts, making the devices more useful for reading books, fitting more information or use by persons with poorer eyesight needing larger fonts. While PalmOS did not prohibit system-level changes such as font replacement, many Android devices do not allow font-replacement without root privileges. A jailbreaking exemption can allow the installation of replacement fonts, which could have aesthetic and usability benefits, and as well as significant accessibility benefits for users with poor vision by allowing the installation of large high-contrast fonts. (It is worth noting that scalable fonts are themselves computer programs in a limited-functionality programming language, and hence would fall under the interoperability exemption that the EFF is seeking.) I would not be surprised if other accessibility issues for the disabled can call for system modifications that require rooting.

2. I am the developer for RootDim, a free application in the Android Market and Amazon Appstore for rooted (i.e., jailbroken) Android devices that controls LEDs and screen brightness. Many manufacturers set an artificial lower limit in software to how low the display brightness can go. (I suspect the limit is to protect novice users who might set the brightness too low

and not know how to set it back.) But there are common use scenarios for which a much lower brightness is necessary. For instance, one of the main user complaints about the Kindle Fire tablet has been that its lowest screen brightness is still too bright for reading electronic books in bed. Furthermore, lowering the screen brightness will increase battery life.

A less common use scenario is that we amateur astronomers need to keep electronic displays very dim in order to protect our dark adaptation, or else we will have trouble seeing various dim astronomical objects in our telescopes.

Moreover, portable devices have other lights--such as keyboard and power lights--that can be unpleasant for users in dark environments and disturbing of dark adaptation. RootDim allows users to control these all such lights.

The need to maintain dark adaptation is applicable in other less common but sometimes important scenarios. For instance, security staff working at night may need to maintain dark adaptation, while yet having to consult a portable device for information or to make a telephone call.

Many people are using portable devices (mainly phones, but small tablets could come to be used for this) as navigational systems in their cars. However, it is an important safety consideration for night driving that there not be bright lights in the car, so as to protect the driver from glare. Less importantly, some users play audio from portable devices such as iPods or phones in the car while driving, for instance listening to audio books. While there are safety issues in such usage (though these can be alleviated: when there is no convenient intersection where I can start or stop playback, I will sometimes ask the front seat passenger), excessive light emission from the playback device is unfortunate. (For this reason, I would urge that the jailbreaking exemption also cover programmable portable media players like the iPod Touch).

Several thousand users have downloaded RootDim, but it does require root system privileges. The jailbreaking exemption allows users to "root" their phone and install RootDim to dim their screens, and I ask that the exemption be extended to other portable systems, including tablets and media players.

Jailbreaking is needed to allow the kind of low-level system interface that RootDim (and the other applications I will mention in the succeeding points) requires.

(For the sake of full-disclosure, I should say that after releasing RootDim, I have found a method for dimming the screen below manufacturer settings that does not require a rooted system, and I have begun to sell ScreenDim, a highly reviewed--currently the approximately 25th highest rated application in the Amazon Appstore--application that controls screen brightness on non-rooted Android devices. However, I am unable to control all system lights without rooting, and thus there is still a real need for RootDim for those who need dark adaptation.)

3. In order to protect the dark adaptation of their eyes, dimming the screen is not enough. It is necessary to shift from using white light to red light,

whose use is less damaging of dark adaptation. For this reason, amateur astronomers (and presumably some other night users) want to turn their device displays to red. While this can be done by placing a physical overlay over the display (the usual material is Rubylith), such overlays are inconvenient to install and remove, and a software solution is strongly preferable.

On rooted Android devices, there is available ChainFire3D, an excellent free application in the Android Market (I am not the developer of it, but my RootDim interfaces with it) that allows users to switch their displays to a red-only mode (ChainFire3D's Pro version also allows other color adjustments, some of which may be useful in other usage scenarios, such as photographers and graphic designers who want to adjust screen color rendition). But because ChainFire3D works at a level that requires system access privileges, this really does require a rooted device.

Again, just as for screen dimming, preservation of dark-adaptation is important in other scenarios, including ones where safety is at issue. For instance, I routinely activate ChainFire3D's red display mode when playing audio books while driving at night to further reduce glare. I can see a security officer who needs to maintain dark adaptation wanting to make sure that his or her phone or tablet have a red display.

4. I am the developer of Force2SD, an application sold in the Android Market and Amazon Appstore that allows users with limited memory Android 2.2 and higher devices to move other applications from the limited internal memory to a secure area on larger flash drive. While the operating system allows some applications to be moved to external memory, applications designed for earlier versions of the operating system normally cannot be moved. Because of system-level activity, Force2SD requires a rooted device.

5. Autoruns (which I am not the developer of) is an open source application for rooted Android devices that allows the user to have fine-grained control of when various application functions get activated. For instance, some applications "watch" for when a certain system condition is met--say, when the device is rebooted or when a new application has been installed--and perform some operation, including potentially a privacy-endangering operation such as logging the fact. For security, privacy and efficiency, a user may wish to forbid applications from activating in such circumstances. Autoruns does that. But it needs a rooted device.

6. I am the developer of Buttons for Archos, an application in the Android Market and Amazon Appstore, which was developed for Archos Gen8 tablets to allow the resizing of certain on-screen buttons that interfered with applications designed for other devices. Again, such a re-design of system "skin" requires root privileges. Buttons for Archos probably does not per se require the jailbreaking exemption because Archos has released development tools that help with installation of an alternative operating system, tools that can be used to install a rooted operating system, and hence jailbreaking an Archos tablet may not count as an unauthorized circumvention of access controls, given implicit Archos authorization. Nonetheless, Archos has not provided such tools for their next generation of tablets, and has not responded to my query whether they authorize rooting, and hence to allow such similar applications for their Gen9 would require jailbreaking.

## Some closing reflections on jailbreaking

Manufacturers of mass-market devices understandably and reasonably aim at providing an excellent usage experience to the typical user. Doing that is probably one of the things leading them to lock their devices, to protect typical users from their own mistakes and from malicious applications, and to reduce technical support load on the manufacturer. However, as a result, the devices do not customize well for somewhat less typical usage scenarios, such as those by persons with visual impediments, amateur astronomers, security personnel, or people who read electronic books at night (actually, I don't think the last should count as an atypical usage scenario, really). Customization going beyond what typical usage scenarios require is called for in these cases, and requires system-level control by the user (or by applications trusted by the user).

There are also cases where manufacturer (or third-party software developer) mistakes make life less convenient for users, in a way that can be remedied by solutions that require jailbreaking. An example in point is Force2SD, where a limitation in the ability to move applications to external memory can be easily overcome by my third-party utility, but only on a rooted device.

There are genuine security and usability benefits to keeping the novice user from jailbreaking a system. But there is no need for this to be legally enforced. The mere inconvenience and technical difficulty of jailbreaking, as well as potential adverse impact on warranties, is sufficient to ensure a balance of the benefits to novice users with significant benefits to somewhat less typical, or more experienced, users. After all, even right now when there is a DMCA exception for rooting phones, many users do not wish to root their phones. But those who do should be allowed to do so.

It is true, alas, that jailbreaking can be a tool in copyright infringement. However, at least from the Android point of view (and that is what I know most about), I do not think this is likely to be a major issue. Typical Android devices already do permit the installation of applications from unapproved sources, including ones downloaded from pirate-run websites. What the devices do not allow without rooting, however, is for the applications to interface with certain system features, including features involved in light or font control. This primarily affects bona fide Android applications such as ChainFire3D, RootDim or Force2SD, making various usage scenarios impossible or significantly less convenient.