Notes

Chapter 1

1. It is important to note that the term *hacker* is not used here in the fashion popularized by the mass media, which has equated hackers with those who break into computer systems or design malicious computer viruses. The latter are more properly referred to as "crackers" or "phreaks." My use of the term *hackers* is consistent with the meaning ascribed to it by those early authors describing hacker culture, such as Stephen Levy (1984), Eric Raymond (2002), and Richard Stallman (2002): In their definition, hackers are more like tinkerers whose curiosity drive them to "look under the hood" of computer programs and systems and then share what they learn with fellow tinkerers. While this definition simplifies the complexity of hacker culture and the tensions that exist in that conceptualization (often hackers are "looking under the hood" of proprietary systems), for our purposes it suffices because it focuses on the more-often-than-not benign intentions behind true hacking.

2. The DMCA (Pub. L. No. 105-304, 112 Stat. 2860) was enacted in 1998 to bring the United States into compliance with a series of international treaties administered by the World Intellectual Property Organization (WIPO). The DMCA provisions that make copyright-protection circumvention technologies illegal (the anticircumvention provisions) are the center of an ongoing debate that seeks to establish a balance between the rights of consumers and the rights of copyright owners.

3. Some may argue that this is what the movement was always about. Perhaps, but I would suggest that today it is more clearly and uniformly articulated by activists and movement organizations.

4. That logic argues that intellectual-property law was designed primarily to incentivize creators and that without such legal protections creative people would simply stop producing, and our intellectual cache would be impoverished. This logic, espoused primarily by the cultural industries, ignores that, at least in the United States, the framers of the Constitution balanced those protections with considerations for the public domain.

5. Those externalities might include the burden that consumers or future creators must bear when they hope to appropriate existing content or other intellectual properties to engage in their own creative activity.

6. I am always loath to use the term *never before*, but when have consumers actually argued for the right to significantly alter mass-media content outside of the safeguards of "fair use" in other similar doctrines?

7. Americans with Disabilities Act (Pub. L. 101-336, 104 Stat. 327 [1990]).

8. Another analogy might be the act of sit-ins during the civil rights movement in the United States. The sit-ins at "white-only" lunch counters challenged norms and law but also thrust into the white world an alternative view of the world as it should be. The presence of black Americans at white-only establishments created the new world of civil rights before the infrastructures (laws) were there to realize them formally.

9. What I am thinking about when I mention the "normative power of law" is how law through its political power also makes implicit how society ought to be structured. For example, copyright law in the United States and its base-level definitions of authors' rights, which are strong, not only explicitly define the rights but also implicitly suggest that those rights are the ones that *ought* to be given. My idea of hacks in this regard—the alternative-licensing schemes such as Creative Commons and hacks such as DeCSS—put pressure on the normatively implied structure through what they make possible and through the arguments that activists present to legitimize their existence.

10. See, for example, RealNetworks, Inc. v. Streambox, Inc. (US Dist. [W.D. Wash. 2000]) and Universal City Studios, Inc. v. Corley (US Court of Appeals [2d Cir. 2001]), where Streambox and Corley claimed fair use as a defense for circumvention. See Felten et al. v. Recording Industry Association of America, Inc. [RIAA] (US District Court [NJ 2001]), where Felten asked the court to judge on the implication of the DMCA regarding his First Amendment rights and on the impacts of DMCA research and innovation.

11. For example, open anonymous networks versus trusted systems that require personal information and identification.

12. See Strahilevitz 2003 for a recent example of this process in the case of peer-to-peer technologies where the design of some applications is meant to structure use of the application in a way that makes the user more likely to share his or her music.

13. Strong democracy is a highly participatory and decentralized form of democracy espoused by political scientist Benjamin Barber (1984).

14. The concept of "technological resistance technologies" is related to Bryan Pfaffenberger's (1992) concept of the "counterartifact." Pfaffenberger's account of

the narratives that create the politics of technology is parallel to frame analysis in social movement theory. Both approaches suggest that the stories we tell to rationalize the norms, technologies, and laws that govern our behavior are important in coordinating how we act out our dictated roles. Pfaffenberger also uses the concept of "technological regularization," which is analogous to technological enforcement. However, I contend that technology need not have ongoing ritual or narrative to support its political effects. Thus, technological enforcement and regulation are unlike regularization in that they are absolute categories. They do not depend on narrative to exert force. As a consequence, I would argue that technological protection measures (TPMs) are unlike counterartifacts because even when they become designified, they continue to have politics.

15. Andrew Feenberg (1999) draws similar conclusions in *Questioning Technology.* However, his interpretation of technocracy is more traditional than mine: rational, objective analysis of social problems by ruling experts and scientific planning and rationally designed systems would solve ideological problems. Of course, he notes, technologies are ideological themselves, and the objective technocrat is the ghost of a myth.

16. Dale Rose and Stuart Blume (2003), for example, have shown in their study of vaccines that users resist state and scientific configurations through specific acts of dissent or noncompliance.

Chapter 2

1. The Copyright Term Extension Act of 1998 (Pub. L. No. 105-298, 112 Stat. 2827) would further extend copyright to the life of the author plus seventy years. The 1976 act was applicable to works made on or after January 1, 1978. For works in their first term, the copyright would last twenty-eight years from the original start date. For posthumous work or work for hire, the term could be extended to forty-seven years, with the Copyright Term Extension Act extending that term to sixty-seven years.

2. Jessica Litman has written at length concerning the legislative history of the DMCA (see, e.g., Litman 2001), and this section is greatly indebted to her work.

3. See appendix A for a complete list of individuals and organizations that submitted comments.

4. The AHRA (Pub. L. 102-563, 106 Stat. 4237 [1992]) mandated that all players/recorders of digital cassette tapes carry the serial-copy-management system. This technology would limit the number and quality of copies made on digital tape players.

5. Note that these consequences focus on the effects of the NII on copyright; other sections of the Green Paper discussed US obligations with respect to a series of

international treaties, detailed discussion of which is beyond the scope of this work. See Lehman 1994.

6. Copyright Act (Pub. L. 94-553, 90 Stat. 2541 [Oct. 19, 1976]).

7. The Copyright Act defines copies as "material objects, other than phonorecords, in which a work is fixed by any method now known or later developed, and from which the work can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device" (section 101). The term *copies* encompasses the material object, other than a phonorecord, in which the work is first fixed, and the term *phonorecords* refers to "material objects in which sounds, other than those accompanying a motion picture or other audiovisual work, are fixed by any method now known or later developed, and from which the sounds can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device. The term 'phonorecords' includes the material object in which the sounds are first fixed" (section 101).

8. Copies are arguably always made, even in the case of streaming content, but these copies are exempted from infringement because they are a consequence of the technology's normal operation.

9. Case law and the legislative history of the Copyright Act had shown that transmission of content among computers resulted in sufficiently permanent fixation. The US House of Representatives report accompanying the Copyright Act noted that digital format is a fixation method covered by the act. In spite of this guidance, the WGIP wanted statutory language to make this point clear.

10. "First sale" is a limitation on the copyright holders' exclusive right to distribute their work codified in section 109 of Title 17, the US copyright law. This section states: "[T]he owner of a particular copy or phonorecord lawfully made under this title, or any person authorized by such owner, is entitled, without the authority of the copyright owner, to sell or otherwise dispose of the possession of that copy or phonorecord."

11. In testimony, critics of the Green Paper noted that this conception explicitly assumes that the consumer is going to keep the original copy, and they chastised copyright owners and the WGIP for assuming that customers will be dishonest.

12. Proponents of expanded use of copyright content argue that courts have left interpretation of the extent of fair use open. See Jessica Litman's and Pamela Samuelson's comments following the release of the Green Paper (*Comments* 1994).

13. The Conference on Fair Use, or CONFU, brought together copyright and user interests to determine the potential impacts of the White Paper recommendations on fair use. Importantly, user interests were mostly represented by institutional actors such as libraries and the measures discussed were primarily aimed at establishing guidelines for libraries and educators.

14. User advocates criticized the recommendation to revisit fair use in the Conference on Fair Use, saying that the issue belonged in rule-making procedures and that the conference was in fact an attempt to marginalize the issue. See the comments by Jessica Litman in *Comments* 1994.

15. The Telecommunications Act of 1996 (Pub. L. No. 104-104, 110 Stat. 56) is a revision of the Communications Act of 1934 (Pub. L. No. 416-652, 48 Stat. 1064).

16. The sale of copying equipment, like the sale of other articles of commerce, does not constitute contributory infringement if the product is widely used for legitimate, unobjectionable purposes. Indeed, it need merely be capable of substantial noninfringing uses.

17. The case of DeCSS, the hack of the DVD access-control technology, is a case in point. Makers of DeCSS (mostly hackers in the open-source movement) failed to convince the courts that the technology was in fact intended for the development of DVD players using the Linux operating system. As such, a host of software developers and users were criminalized. In the five years since this case, it is clear the DeCSS indeed served legitimate noninfringing purposes because the DeCSS technology and its analogs are now found in all software that allows DVDs to be played on Linux machines.

Chapter 3

1. See comments from ISPs such as America Online and AT&T in *Comments* 1994.

2. See, in general, *Comments* 1994.

3. Lawrence Lessig and James Boyle are two other prominent legal scholars who have espoused this view. In general, they believe that digital technologies for editing and sampling can make active cultural remixers of all uses of digital media. See Boyle 1997; Lessig 2004.

4. Recent events such as Grey Tuesday in which more than five hundred Web sites distributed a banned remix of two popular artists' songs as an act of "digital civil disobedience" bear out Mr. Rothman's prediction. See http://www.downhillbattle .org and chapter 8 for more on Grey Tuesday.

5. The NET Act (Pub. L. No. 105-147, 111 Stat. 2678 [1997]) became law a year before the DMCA, so in a sense the White Paper served to buttress the policy rationale for an overall coordinated strategy to ready the DMCA for the realities of the virtual networks.

6. As is evident in the surge in lawsuits brought against consumers following changes in copyright law in the late 1990s—where, for example, a single mother in Chicago was ordered to pay $22,000 for sharing thirty songs on a peer-to-peer network—the extent of criminal liability appears increasingly out of sync with the

crime (Newton 2005a). Consumer surveys in 2005, for example, show that sharing of copyrighted material continued unabated in spite of such lawsuits (Madden and Rainie 2005; Newton 2005b).

7. The Berne Convention for the Protection of Literary and Artistic Works is the oldest and principal treaty regulating copyright internationally.

8. Pamela Samuelson has noted that the DMCA went beyond the obligations.

9. Here I am reading 1201(b) to imply that "manufacture" means manufacture with the intent to distribute. But if read more literally, the statute might mean that even the manufacture by a single individual for her own use is illegal. In which case, the allowance for circumvention of copy-control technology would be even more hollow.

10. A point also raised by Pamela Samuelson (1999).

Chapter 4

1. This feature works as long as the computers are networked and the eBook reader on one computer can check on the originating computer so that multiple instances of the book are not opened. However, most publishers will not allow for this sharing. The Microsoft Reader does not have this feature and allows you to read the book in only two authorized machines.

2. I discuss Creative Commons and the Creative Commons license in chapter 8.

3. The DeCSS case (reviewed in chapters 5 and 6) also made the same argument. The argument that code is speech had been made in previous cases. See Bernstein v. US Department of State, 922 F. Supp. 1426 (ND Calif. 1996).

4. My summary of ElcomSoft's arguments is derived from transcripts of the cases United States v. Dmitry Sklyarov and United States v. ElcomSoft, US District Court (ND Calif., San Jose Div., 2001 and 2002).

5. ElcomSoft in fact made this comparison explicit as it cited Chicago Lock Co. v. Fanberg (676 F.2d 400, 216 USPQ [BNA] 289 [9th Cir. 1982), a case involving instructions on how to reverse engineer locks protected by trade secret.

6. This suggestion was made in pre–September 11, 2001 days, when tracking of every citizen was generally an abhorrent idea to the US public. Sentiments may have changed since then.

7. ElcomSoft noted: "The DMCA does not purport to prohibit the violation of copyright laws. Instead, it regulates speech that might facilitate such violations. . . . Congress focused not on the infringer himself, but rather on a person more removed from the infringement (but perhaps easier to locate). However expedient such an approach might be, it fails to maintain the crucial connection between the

government's ends and the means used to accomplish them. The infringement of a copyright is wrong in and of itself; the circumvention of a technological measure protecting that copyright is only wrong in those circumstances in which a copyright will be infringed as a result" (United States v. ElcomSoft [2002], Motion to Dismiss on First Amendment Grounds).

8. These organizations included the EFF, Association for Computing Machinery, American Association of Law Libraries, Consumer Project on Technology, Electronic Privacy Information Center, and Music Library Association (United States v. Dmitry Sklyarov [2001], Amicus Brief EFF et al.).

9. "When speech and non-speech elements are combined in a single course of conduct, a sufficiently important government interest in regulating the non-speech element can justify incidental intrusions on First Amendment freedoms" (United States v. ElcomSoft [2002], Motion to Dismiss on First Amendment Grounds).

10. "The principal inquiry in determining whether a statute is content-neutral is whether the government has adopted a regulation of speech because of agreement or disagreement with the message it conveys" (United States v. ElcomSoft [2002]).

Chapter 5

1. Macrovision is the copy-protection technology mandated by Congress on all VHS tape recorders in response to copyright owners' fears that films on VHS tapes would be copied "en masse" by consumers.

2. Notably, reverse engineering of software applications for the purposes of interoperability and education is permissible under exemptions of the copyright law. The license asks users to give up this privilege as a condition of use.

3. "There is no legal precedent or court decision in Norway to support a claim that reverse engineering is a violation of Norwegian criminal law. No Norwegian court has issued any such ruling" (DVD CCA v. Bunner et al. [1999], Declaration of Jon Bing for Defendants).

4. "The ability of the software at issue to play DVD discs from various regions does not violate any right or privilege available under law to the copyright owner of the movie on the disc; 'code-free' consumer DVD players already exist and offer the same capability. In my opinion, the regional coding system was built as a business strategy, to give a technological edge to theater owners, to the disadvantage of consumers; there are no legal consequences if this intended edge does not materialize in practice" (DVD-CCA v. Bunner et al. [1999], Declaration of John Gilmore).

5. These data are derived from analysis of subsequent filings, in which some defendants were dropped because they complied with the court order, whereas the great majority did not.

Chapter 6

1. Review of the transcripts from this hearing shows that Judge Lewis Kaplan allowed the defense very little latitude, questioning every motion and argument, sometimes without giving the EFF a chance to complete its argument. At times, the defense is demonstrably flustered by Kaplan's antagonism. In contrast, the plaintiffs received no such treatment or questioning; in fact, Judge Kaplan simply accepted their arguments and became their most vocal advocate, even submitting a well-prepared explanation of his decision to grant the injunction during the hearing.

2. In context, many Internet posters were expressing frustration at being banned from distributing software that they felt represented free speech and the ability to make Linux DVD players. However, in court the rhetoric became indefensible.

3. Garbus has defended Lenny Bruce, Henry Miller, and Salman Rushdie, among others, in First Amendment cases.

4. Readers' ability to access primary materials has given rise to citizen journalism through blogs and thus in turn ironically challenged the institutional authority of mainstream media news.

5. Institutional tactics are methods of challenging law and repression through traditional structures such as courts or the legislature. Extrainstitutional tactics are outside of established structures and include disruptive collective action such as protests, civil disobedience, and hacking.

6. According to section 1201(f) of the DMCA, "§Notwithstanding the provisions of subsection (a)(1)(A), a person who has lawfully obtained the right to use a copy of a computer program may circumvent a technological measure that effectively controls access to a particular portion of that program for the sole purpose of identifying and analyzing those elements of the program that are necessary to achieve interoperability of an independently created computer program with other programs, and that have not previously been readily available to the person engaging in the circumvention, to the extent that any such acts of identification and analysis do not constitute infringement under this title."

7. For example, a report from the Pew Internet and American Life Project noted that after the RIAA started suing individual file swappers on peer-to-peer networks, the number of users dropped by almost half. See Rainie and Madden 2004.

8. For example, the US Supreme Court decision in MGM v. Grokster noted that the technology makers would be held accountable if there was no legitimate use *and* if there was inducement on the part of the technology makers to violate copyright (MGM Studios et. al v. Grokster, LTD., et. al, Case No. 04-480 June 27,

2005). Both sides claimed this decision a victory. The makers of peer-to-peer technology, for example, noted that as long as they make it clear that their technology is meant for sharing of legal files, then they can go about their business.

Chapter 7

1. By May 7, a little more than a week after launch, Apple sold one million songs on the iTMS. See Wilcox 2003.

2. Apple continuously tweaks its EULA, so since the time of this writing some changes may have occurred. However, the EULA's basic mechanics and general thrust remain the same. As noted later in this chapter, the TOSA and EULA have changed so that many of the restrictions talked about here have been lifted, particularly on music downloads.

3. As the business model took hold, Apple lowered its restrictions to five songs. Today these restrictions have been lifted, and music bought on the iTMS is no longer protected by DRM.

4. Of course, content on a computer is always at some level accessible as a copy either through the analog hole or by capturing the data on its way to the software that plays it. Secure hardware architectures promise to plug these gaps.

5. The services were formerly available at Spymac.com and ShareiTunes.com. These applications are no longer available.

6. See Ian Freid quoting an Apple release at http://news.com.com/Apple+limits+iTunes+file+sharing/2100-1027_3-1010541.html.

7. This type of work-around was later stymied by the release of iTunes 4.5, which prevented compatibility between various version of iTunes.

8. These sorts of statements concerning the legality of a technology tell us much about user attitudes concerning what users ought to be able to do with legally purchased content. For users, issues of access and personalization (which, for the digital rights movement, are translated into issues of creative and participatory privileges) continue to be central.

9. MyTunes resurfaced in September 2004 under the name "MyTunes Redux." See http://minimalverbosity.com and Borland 2004a.

10. Although Johansen's involvement was integral in the development of DeCSS, it was not fleshed out in chapter 5 or 6 because the analysis there focused on DeCSS in the US courts. Johansen is a Norwegian citizen, and although he was tried in Norway for his development of DeCSS, he did not play a large role in the US court cases.

11. Many legal scholars have commented that DMCA section 1201 essentially grants a new right to copyright owners, the "access right."

12. During development of an open-source project such as VLC, contributors will add their contributions to a public library of applications, which serves as an unofficial collection of proposed changes to the project. Project leaders will periodically update the official release of the application with work from the unofficial library.

13. BIOS stands for "basic input/output system." It is a software package written for a computer's bootable memory (flash chip, ROM, or RAM). The BIOS allows a PC user to have access to input/output devices such as monitors and keyboards before the operating system has loaded.

14. Note that when a song is transferred to an unauthorized computer, it has the encryption from the authorized computer. Thus, VLC on the unauthorized computer cannot simply crack it as it did on the authorized computer. That is why the keys generated from VLC's cracking on the authorized machine must also be transferred to the unauthorized machine.

15. Recall that the VLC component did not produce an unprotected file; it generated the song keys, which could be copied along with the DRM-protected song to unauthorized machines that used the VLC. The VLC installed on unauthorized machines would use the imported song keys to play the DRM-protected song.

16. The Hymn Project Web page contradicts the "readme" file, stating that there are no GUIs available for Mac, yet the "readme" on the Hymn 7.0 release shows the GUI. Thus, I assume that the early version did not have a GUI and that the later version—probably when PlayFair became Hymn—does have a Mac GUI. Also note that the song keys must still be generated with an iPod, so for PlayFair to work on a Mac, the iPod with those songs must be connected.

17. I am assuming that the developer is male based on a review of interviews with media, postings on the Hymn Web site, and the developer's references to himself.

18. Johansen also designed PodKey, a utility that would access an iPod's "key store." PodKey can retrieve the song keys from an iPod and make them available to DeDRMS. Thus, a user without an Internet connection to the iTMS server can still authorize more than one computer to play a song by simply having her iPod handy. This is similar to what PlayFair/Hymn does when used on a Mac.

19. A jury might find that these technologies' self-policing features show that the developer did not intend to facilitate egregious file sharing, but only to allow limited file copying for loosely defined personal uses.

Chapter 8

1. Pub. L. No. 103-414, 108 Stat. 4279.

2. The reader will notice that in my discussion of Creative Commons I do not address its framing tactics in the media. This omission has been made because Cre-

ative Commons has not done media outreach to a large extent. Although it does get its message "out" via traditional media outlets, its primary audience is artists and other intellectual-property creators whose adoption of Creative Commons licenses is sought by the organization. Therefore, framing strategies are tailored toward these niche groups and typically do not find their way into mass media.

3. At the time that Battle Labs was surveyed, the projects were under various stages in development. They are listed here as an example of the kinds of technological measures that were potential parts of the digital rights movement.