

Chapter Five

The Digital Moment: The End of Copyright?

The jazz pianist Herbie Hancock started his career in Chicago in the 1960s, playing with such legends as Donald Byrd, Wes Montgomery, Quincy Jones, Sonny Rollins, and Dexter Gordon. By the late 1960s, Hancock had moved beyond blues and bop, experimenting with the avant gard sounds of Eric Dolphy. Most of Hancock's notoriety came from his mid-1960s work in the legendary Miles Davis Quintet. Hancock and Davis split in 1968. But in separate groups they both soon pushed the rhythmic foundations of jazz into new areas through the late 1960s and early 1970s, embracing funkier rhythms and more lively, colorful arrangements than the hard bop that had dominated the scene for most of the decade. As a keyboard player, Hancock soon discovered the creative potential of a new instrument - the electronic synthesizer. Synthesizers offered Hancock and other composers a new set of sounds and new ways to manipulate them. Keyboard players could generate thousands of new sounds: buzzes, chirps, whistles, solid tones (with unlimited sustain), crashes,

and sirens. Players could alter the pitch, duration, and timbre of a song by tweaking a few knobs or dials.¹

Early synthesizers were huge and ungainly, difficult to employ for live performances. They used analog technology. Different electric voltages created and controlled the sounds. Higher voltages generated higher notes and lower voltages created lower notes. The first generation of synthesizers could play only a single note at a time. To get more musical depth and texture and to play simple chords, musicians stacked several expensive synthesizers to play at once or layered parts on tape, mixing it later in the studio. By the mid-1970s, several companies had introduced polyphonic analog synthesizers with attached keyboards. Soon synthesizer companies added computer memory to their systems, easing the use of smaller synthesizers in live shows. By 1979, keyboards came with computer interfaces installed. If all of a musician's synthesizers were of the same brand, they could operate together through a single keyboard. But there was no standard of compatibility. Each company's equipment offered different features and abilities. Hancock, enchanted by the new gadgets, customized connections for his various synthesizers so they would work in concert. Hancock's

hacking inspired the next revolutionary move in electronic music: the creation of an open compatibility standard known as the Musical Instrument Digital Interface, or MIDI, in 1982. MIDI software protocols tell a synthesizer the duration of a note, the shape and pitch of a sound, and its volume.²

MIDI transforms the analog signal of a synthesizer into a digital stream, representing all the variances of sounds in a string of zeros and ones. And MIDI allows that information to flow over a network of musical instruments, input and output devices.

Within a couple of years, MIDI became the universal standard for digital music. And its success opened the music industry to the potential of converting every step in its production process to digital technology. The MIDI standards are now used by home computers to generate, share, and play music and video files. At its heart, MIDI is like the blues-based music that inspired Herbie Hancock's career - portable, widely compatible to a variety of instruments, open for anyone to improve, and thus powerfully adaptable.³

The parallels between jazz and open technology were not lost on Hancock, who had been an engineering student at Grinnell

College in the 1950s. In 1983, Hancock released an electronic album called *Future Shock*. It featured single called "Rockit" that soon climbed to the top of dance and soul charts and garnered a Grammy award for best rhythm and blues single. The song featured sampled sounds and "scratches" like rap artists were using over a bed of jazzy electronic keyboard riffs. "Rockit" had an infectious beat. Most revolutionary, Hancock released a video of the song at a time when MTV was in its infancy. The video featured a group of robots with dismembered appendages dancing around while Hancock performed on his electronic keyboard. Hancock not only inspired the digitization of music in general and the daring fusion of pop music styles, he helped establish the music video as a site of intense creativity in the early 1980s.

Hancock was also instrumental in making digital sampling acceptable as an artistic technique within the African-American musical tradition. Few jazz musicians have embraced sampling as eagerly as Hancock has. In 1993, Hancock allowed the rap group Us3 to sample his 1964 classic "Cantaloupe Island." Us3 worked with the Blue Note jazz catalogue to create the hit album *Hand on the Torch*, which opens up with the funky dance single

"Cantaloop."⁴ To sample a piece of music, one must convert it from analog to digital signals. We live in an analog world. The sensations we experience are manipulations of light and matter, interpreted by our organs and mind as waves. These waves have several aspects to them, most significantly frequency and amplitude. When someone plucks a guitar string, her finger vibrates the string, the string vibrates the air, and the air vibrates our eardrums. We can represent the pluck in many ways, including a drop of ink on music staff paper. This is an analog representation. The musician's eyes can scan the paper, sense the difference in light reflecting off the staff paper, and relay a signal to her mind. Her mind then signals her finger to pluck the same string for the same duration. We can record the pluck as a series of magnetic flakes on plastic tape. We can carve grooves into plastic or wax to replicate the sound.

Or we can convert the manipulations of matter that make up an analog signal into digital form -- a series of ones and zeros -- by running the sound through computer software. The computer measures the frequency and amplitude of each sound and generates a string of Boolean signals to represent each sound and shift. A computer can store these digital signals in a variety of media.

It can then play the signals back with something close to perfect reproductive quality. Of course this method of representing analog signals in digital form does not limit itself to sound. Reflections of light can be represented the same way, allowing for the conversion of all sorts of images into strings of digits. As Paul Goldstein explains, digital formats offer three powerful advantages for creativity and economy: fidelity, compression, and malleability. At first glance, these features seem terrifying to the copyright rich and exciting to the copyright poor. But that is not necessarily so.

Defining the Digital Moment

Herbie Hancock was present at the dawn of the digital moment. From the early 1980s through the late 1990s, artists, musicians, hackers, intellectuals, policy makers, and business leaders embraced the transformative potential of digital technology. Besides representing all forms of expression digitally, the other, perhaps more significant process inherent in the "digital moment" is the rise of networks. the ability for people to share ideas, information, expressions, truths, and

lies over vast distances in virtually no time (and at no discernable marginal cost) has deeply frightened the powerful and empowered those blessed with a connection to the network.⁵

The synergistic relationship between these two processes - digitization and networking - has collapsed some important distinctions that had existed in the American copyright system for most of the 20th century. Converting Mozart's "Jupiter Symphony" into a series of ones and zeros has collapsed the idea-expression dichotomy. Ones and zeros are the simplest possible grammar through which we can express anything. A living, breathing symphony orchestra may be the most complex medium one could choose to express the same notes. And the analog vibrations in the air that fills a symphony hall might be the most complex grammar one could use to express those ideas. Perhaps the ones and zeros are ideas, and the analog versions we inhale are the expressions. But if strings of ones and zeros operate as an alphabet, a code, for representing ideas, shouldn't they enjoy status as expressions? Are strings of digital code expressions worthy of both copyright protection and First Amendment protection?

The digital moment has also collapsed the distinctions among three formerly distinct processes: gaining access to a work; use (we used to call it "reading") of a work; and copying of a work. In the digital environment, one cannot gain access to a news story without making several copies of it. If I want to share my morning newspaper with a friend, I just give her the object. I do not need to make a copy. But in the digital world, I do. When I click on the web site that contains the news story, the code in my computer's random access memory is a copy. The source code in hypertext markup language is a copy. And the image of the story on the screen is a copy. If I want a friend to read the story as well, I must make another copy that is attached to an e-mail. The e-mail might sit as a copy on my friend's server. And then my friend would make a copy in her hard drive when receiving the e-mail, and others in RAM and on the screen while reading it. Copyright was designed to regulate only copying. It was not supposed to regulate one's rights to read or share. But by collapsing the distinctions among accessing, using, and copying, copyright policy makers have found themselves faced with what seems to be a difficult choice: either relinquish some control over copying or expand copyright

to regulate access and use, despite the chilling effect this might have on creativity, community, and democracy.

The third distinction that the digital moment collapsed is that between the producers and consumers of information and culture. The low price of network-ready computers and digital equipment in the United States has reduced the barriers to entry into music, literature, news, commentary, and pornography production and distribution. For less than \$5,000 dollars in 2000, a young person could record, produce, edit, advertise, and distribute hundreds of new songs. Of course, the ease of distribution and the low barriers of entry have created a cacophony of "white noise" in the digital environment. Creativity has been democratized, but it's that much harder to attract an audience or a market.

Digitization and networking have also collapsed the distinctions between local and global concerns. The U. S. Congress can pass a law outlining gambling on the Internet. But the U.S. government has no authority to regulate a server on a small island in the Caribbean Sea. As with all questions of digital regulation, what jurisdiction should rule on copyright concerns?

The distinctions among the different types of "intellectual property" have also eroded, if not collapsed. They have certainly collapsed in the public mind and generated much confusion in public discourse. The distinctions also have collapsed in practice. For instance, computer software was until the late 1980s the subject of copyright protection. Then, the U.S. Patent office started issuing patents for algorithms. As the industry has grown, so have the stakes in its legal protection. Now software can carry legal protections that emanate from copyright, patent, trademark, trade secret, and contract law. So while the phrase "intellectual property" was merely a metaphor and an academic convention in the 1960s, by 2000 it was a reality.⁶

The "Digerati" and "Copyleft"

The digital moment inspired a flurry of intellectual work about copyright. Not since the American literati campaigned for international copyright protection in the 1870s and 1880s had so many important writers and thinkers waxed about copyright policy. Most influential among the "digerati" was John Perry

Barlow, a founder of the Electronic Frontier Foundation and former lyricist for the Grateful Dead. Barlow wrote that the application of traditional copyright laws to the digital environment was a fundamental misunderstanding and mistake. In an influential 1994 essay in *Wired* magazine, Barlow wrote that copyright was designed to protect ideas as expressed - in fixed form - but not the ideas or bits of information themselves. He chose the metaphor of wine and bottles: copyright protects the bottles, not the wine. But now the bottles have all overflowed. So the system seems to make no sense, Barlow wrote. Barlow did not prescribe a solution to the digital dilemma. He only named and outlined the problems that large portions of the global economy would confront over the next five years.⁷

While Barlow diagnosed a problem inherent in the digital moment and celebrated what he thought might be a powerfully libertarian moment, Richard Stallman sensed just the opposite trend in the late 1980s. Stallman, a programmer who was then working for the Massachusetts Institute of Technology, saw that the rise of proprietary software systems as a severe threat to freedom and creativity. In fact, Stallman argued, too much control over software through contract, trade secrets, or

copyright impeded the development of the best possible software. The software industry was born out of collaboration among the academy, the government, and private industry. And in the 1960s and 1970s, much of the culture of software reflected the gentle openness and spirit of community and inquiry that exists within the academy. But once the industry outgrew its own incubators, a different, conflicting value infected its practices. What was once public, shared, collaborative, and experimental became secret, proprietary and jealously guarded. Back in the 1960s and 1970s, only computer programmers used computers widely. So software companies (which were more often than not also hardware companies such as AT&T and IBM) released the source code with their software so that programmers could alter and customize it to their needs. Source code is the set of instructions that human beings write in languages such as Fortran, Pascal, COBOL, and C++. Programmable computers have a feature called a "compiler" that translates source code into "machine language," or object code. In general, only humans can read source code. Only machines can read object code. As the software industry blossomed in the 1980s, companies realized there was commercial value in keeping the source code secret. If a buyer needed a

particular feature, it had to order it from the software company. Plus, competing software companies would have a difficult time replicating the effects of the object code without access to the source code. Before the rise of Windows, UNIX was one of the most common and powerful operating systems available. It was flexible, powerful, and stable. But it was hardly user-friendly. Only professionals dared to play with UNIX. When AT&T, which distributed UNIX (although it was developed in collaboration with universities, especially the University of California at Berkeley) bottled up its source code in the 1980s, it angered many computer programmers who had considered themselves part of the UNIX team. Among these was Richard Stallman. Stallman grew frustrated that he could not customize UNIX to run particular printers and other peripherals. If he could only get a peek at the source code, it would take him minutes or hours to create a patch and make the system work better. Instead, every time UNIX users had a problem, they had to wait months or years for AT&T to roll out another version and fix it.⁸

Frustrated by the unwillingness of university computer administrators to stand up for their values in the face of

increasing corporate control, Stallman left MIT and founded the Free Software Foundation in 1984 to promote the use of "free software," programs unencumbered by proprietary restrictions on alterations, revisions, repairs, and distribution. Also in 1984, Stallman wrote the "GNU Manifesto." GNU stands for "Gnu's Not UNIX!). In the manifesto, Stallman wrote, "I consider that the golden rule requires that if I like a program I must share it with other people who like it. Software sellers want to divide the users and conquer them, making each user agree not to share with others. I refuse to break solidarity with other users in this way. I cannot in good conscience sign a nondisclosure agreement or a software license agreement."⁹

Stallman went to great lengths to define the freedom he valued. It was not the "give it away for free" freedom that idealized the foolishly generous. Stallman said that "Free Software is a matter of liberty, not price. To understand this concept, you should think of 'free speech,' not 'free beer,' " he wrote. Stallman outlined four specific freedoms central to the Free Software movement:

- The freedom to run a program for any purpose.

- The freedom to examine and adapt a program (thus be able to get access to the source code - it would be "Open Source").
- The freedom to distribute copies.
- The freedom to improve any program.¹⁰

Stallman started coding free programs that would work with UNIX. But he hoped for a better yet open operating system to emerge. In the 1990s, some other programmers generated LINUX, the operating system Open Source champions needed to make free software important and powerful. The Free Software movement has grown to be a major force in the software world by the year 2000. But for this phenomenon to occur, Stallman had to come up with a way to ensure that no one company could corner the market on the work that Free Software programmers produced. If Stallman and his collaborators released their programs without any copyright protection, declaring them in the public domain, then any company such as AT&T or Microsoft could bottle up that work by adding a few proprietary and highly protected features. So instead, Stallman came up with an ingenious license that he called "Copyleft."

Copyleft licenses require that anyone who copies or alters Free Software agrees to release publicly all changes and

improvements and these changes will retain the Copyleft license. Thus the license self-perpetuates itself. It spreads the principle of openness and sharing wherever someone chooses to use it. This prevents any company from trying to release proprietary versions of free software. If a company were to release a "closed" or "unfree" version of the software, it would be violating the original "GNU General Public License" (or GPL) that it agreed to in the first place. The code and the freedoms attached to it become inalienable. The proliferation of free software could not have occurred without this license, which uses the power of the copyright system to turn copyright inside out. Copyleft's power and popularity has allowed many people to examine the foundations upon which copyright rests and ask whether its powers have actually worked to impede creativity. By the year 2000, the principles behind Free Software and Copyleft remained fringe views, even though the software they inspired and enabled had worked its way into the mainstream of the computer industry.¹¹

Among those in the 1990s to make sense of the digital moment, Stanford Law Professor Paul Goldstein of was the most prescient of observer of copyright issues and trends. In his

1994 book *Copyright's Highway: The Law and Lore of Copyright from Gutenberg to the Celestial Jukebox*, Goldstein outlined an optimistic vision of the digital moment and its potential for both producers and consumers. Goldstein saw on the local horizon a day when all cultural content - text, music, video, software, video games, virtual reality environments - could be streamed into our homes through one wire and out of one box. Each consumer would have instant access to huge and substantial private libraries of culture and information.

Goldstein saw three vestiges of traditional copyright policy impeding his pay-per-view utopia: fair use; private, non-commercial, non-infringing copying; and the idea-expression dichotomy. Goldstein had fallen under the sway of the fundamentalist "Law and Economics" school of copyright analysis. According to this school, broad appeals to values beyond material concerns - culture, beauty, dignity, democracy -- invited inefficiency into social, political, and economic systems. These extra-economic principles are not bad ideas per se, according to Law and Economics concepts, but proposals that appeal to them should be justified by tests of their utility. Within this school of thought, fair use and home copying have no

inherent educational or democratic value. Fair use is not a good idea per se, but only a necessary flaw in what might otherwise be a perfectly efficient and rational market for cultural goods. Fair use exists simply because the "transaction costs" of restricting copying in the home and schools would be too high to justify enforcement. If Home Box Office or its parent Time Warner had to negotiate with a consumer every time she made a videotape copy of *The Sopranos* for later viewing, the consumer would probably not bother recording the show. Perhaps out of frustration she would decide not to watch the show. The transaction costs of time, money, and stress would not justify the small reward the consumer gets from home recording nor the small return the company would get from charging each time the consumer recorded the show. Similarly, the transaction costs of regulating every time a teacher makes a copy of a newspaper article for 30 students would be too high to justify the hassle of extracting permission and payment. Imposing high transaction costs would only chill their use. Therefore, the Law and Economics theorists argue, society benefits from fair use and private, noncommercial domestic copying only because producers can't exact transaction costs easily and efficiently. They can't

monitor every use. They can't send a bill through the mail and expect timely payment every time someone records a show. But Goldstein argued that the digital moment and the potential of the Celestial Jukebox reduces transaction costs to just pennies per use. Users and producers would negotiate terms just once - upon subscription. Freeloaders and scofflaws would be locked out of the jukebox. And most importantly, producers would have exact measures of consumer demand, even concerning the smallest possible slivers of cultural production such as quotation and raw information. Goldstein saw this as the best possible bargain. It maximizes market efficiency and democratizes gatekeeper decisions. It would deliver the maximum number of products in the shortest possible time for the lowest marginal cost to producers.

For the Celestial Jukebox to work at maximum efficiency, fair use would not just be economically unnecessary, it would be a problem. Fair use is copying that occurs outside of the gaze of the market. Despite cold Law and Economics pronouncements to the contrary, fair use has clear albeit unquantifiable social benefits - for public education, for instance. Other forms of fair use assume that the user need not and probably should not

request permission from the copyright holder. A highly critical film review or scholarly article demands that the critic or scholar have the confidence to re-use portions of the original work in the subsequent work. If the copyright holder wanted to work the Celestial Jukebox most efficiently, it could extract higher rent for critical use, deny permission entirely, or exact retribution by limiting access to other works in the future. And if parodists had to extract permission and make payment for the original work they target, they would probably all give up. A rare and brave copyright holder would willingly allow its works to be viciously ridiculed. Although Goldstein did not consider this problem in *Copyright's Highway*, the potential for corporate censorship under the Celestial Jukebox is unlimited. And, as Goldstein points out, for the market to work as efficiently as he would hope, producers would have to precisely monitor use and demand. This not only raises serious privacy concerns, it renders transgressive fair use impossible. This potential social and cultural cost did not trouble Goldstein. He argued that only the strongest possible corporate protections could generate incentives to justify the investments in bandwidth infrastructure necessary to pipe all that digital content into

our homes. Toward this end, Goldstein endorsed controversial database protection efforts, applauded the recapture of "leakage" caused by educational fair use copying, and proposed strong proprietary software protection through copyright and trade secrets law.¹²

Aware of the potential effects of the digitization of all cultural production and the potential for an unstable copyright system, policy makers in the late 1990s set about strengthening and expanding copyright and making Goldstein's vision of a Celestial Jukebox possible. They used alarmist rhetoric and claimed that they had to act to strengthen copyright lest they invite anarchy. In 1995 the Clinton Administration released its manifesto on copyright and information policy. It was called "Intellectual Property and the National Information Infrastructure: The Report of the Working Group on Intellectual Property Rights," usually referred to as the "White Paper." The White Paper summarized what it considered to be the state of the copyright regime in the early 1990s, just as digitization and digital networks rose to prominence and revealed their promise. But its summary ignored all moves in the history of copyright that extended or protected the public, or users' rights. In

fact, the paper refers to fair use and other users' rights as a "tax" on copyright holders, as if copyright were not granted carefully by the citizens of a nation to copyright holders as part of a carefully balanced deal. So it overstated - in fact distorted -- the status quo. Then the White Paper suggested ways to "extend" copyright to cyberspace, as if the traditional principles of copyright did not apply in the new medium. The White Paper paid no attention to the public interest concerns of the copyright system. In fact, the subsequent legislative moves - including the Digital Millennium Copyright Act of 1998 - essentially evaded copyright as a function of deliberation and legislation. It lets copyright holders be copyright cops.¹³

Four Surrenders

At the behest of content industries and with little public discussion, the Clinton Administration used the White Paper as the blueprint to engineer four surrenders of important safeguards in the copyright system:

- The surrender of balance to control. As a result of the chief piece of legislation in recent years, the Digital Millennium

Copyright Act, content providers can set the terms for access to and use of a work. There is no balance if the copyright owner has all the power.

- The surrender of public interest to private interest. The rhetoric of "intellectual property" in the 1990s was punctuated by appeals to prevent theft and efforts to extend markets. There was little public discussion about copyright as a public good that can encourage a rich public sphere and diverse democratic culture.

- The surrender of republican deliberation within the nation-state to unelected multilateral non-governmental bodies.

Copyright issues went global. Ancillary markets for music and motion pictures became central to marketing efforts. So the World Intellectual Property Organization and the World Trade Organization assumed a greater role in copyright policy as multinational media companies sought global standards that satisfied their ambitions.

- The surrender of culture to technology. The Digital Millennium Copyright Act forbids any circumvention of electronic locks that regulate access to copyrighted material. Before 1998 copyright was a public bargain between producers and users. It was

democratically negotiated, judicially mediated, and often messy and imperfect. Now the very presence of even faulty technology trumps any public interest in fair use and open access.

Going Global

One of the major mechanisms behind these surrenders was the World Intellectual Property Organization, or WIPO. Four times in the 20th century representatives from up to 127 nations have met to revise the Berne Convention for the Protection of Literary and Artistic Works. They first met in 1886 after a group of European authors, led by Victor Hugo, convinced political leaders that Europe should standardize its copyright laws to prevent rampant piracy from neighboring states. Before Berne, for example, many popular French works were pirated in Belgium and sold cheaper than the originals.

Although the United States agreed in 1891 to share copyright protection with the British Empire, it refused to join the Berne Convention until 1989. The reasons for the United States' century-long resistance to Berne are complex, but they boil down to the fact that for much of American history, the

United States has been a net copyright importer, while Europe was a net copyright exporter. European countries in general have afforded broader and deeper protection to authors and publishers than the United States has. For the most part, American copyright theory has leaned toward making books cheaper and more available and -- when it appeals to its Madisonian Republican roots -- encouraging free and rich speech.¹⁴

But all that has changed. The United States by the late 20th century had become a net copyright exporter. Software, compact discs, and American films are among its strongest exports. Recent moves -- initiated by the European Union and the Clinton administration -- have jeopardized the good things about American copyright law: that its relatively loose fair use provisions and limited duration have through most of its history acted to the benefit of science, education, democracy, creativity and freedom. Specifically, these recent moves at the latest meeting of the Berne Convention in Geneva in December 1996 threaten one of the bedrock principals of American copyright law: the idea/expression dichotomy.

The delegates in Geneva considered three treaties. They approved two of them and tabled the other for further

consideration in pending meetings. The two treaties that passed Berne, as the WIPO Copyright Treaty and the WIPO Performances and Phonograms Treaty, have some major problems. The third treaty they considered, which would have created a whole new area of "intellectual property" law, would have protected databases from piracy and unauthorized use. The database proposal is the most dangerous of the three. It could limit scientific exploration. It could severely restrict debate on public policy. It could render information a resource available only to wealthy people in wealthy nations.¹⁵

The WIPO Copyright Treaty provides that computer programs will be considered "protected as literary works." This is consistent with U.S. case law and with standard procedure around the world. However, the protocol clearly considers copying software into Random Access Memory, or RAM, potentially liable copying. This is consistent as well with U.S. case law. On my laptop, as on many other models, I can create an imaginary RAM disk, so I can load a program like Microsoft Word into it and run the computer on its battery without spinning the hard drive, which eats up time and energy. Whenever I look at a web page, it gets copied into RAM until I exit the browser. And JAVA plug-in

modules, little programs embedded in web pages that you load into RAM to use briefly, but then discard when you move on, could be the source of future lawsuits. Most of this is copying would not really become a problem because I am not trying to sell the RAM copy, but potential complications and conflicts lay beneath the surface. If I send a pirated piece of software to you via e-mail, it gets copied into your Internet service provider's computer. Then, when you open it up, not knowing what it is, you have made a copy in RAM. This could be a violation by both your provider and you, without even knowing about it. The treaty could have contained language that would exempt copies made while "browsing" and transferring data. Delegates from underdeveloped nations pushed for it, but the American representatives objected. They settled on broad, foggy language that individual nations will consider differently.¹⁶

The second Berne treaty, the WIPO Performances and Phonograms Treaty, dealt with music. In the commotion over database protection proposals and moves to better protect software, few have examined the implications of this treaty. Through the Performances and Phonograms Treaty, U.S. copyright law would for the first time adopt a codification of a

composer's "moral rights." Moral rights represent a position in copyright theory by which the author, composer, or director, has almost complete control over the ways in which his or her works shall be presented or manipulated. Moral rights have been part of the European copyright tradition since the first Berne convention in 1886 but had never been part of American law. There have been cases in which moral rights crept into the discourse of American law, but this was usually because the judges did not know what they were doing. Thus European law has for the last hundred years served the interests of artists and publishers, while American law has purported to serve the interests of the public at large.¹⁷

Through the WIPO Performances and Phonograms Treaty a composer or even a performer can claim a right to be identified as the performer and can prevent any "distortion, mutilation or other modification of his performances that would be prejudicial to his reputation." In other words, performers would have veto power over parodies of their work. This provisions directly speaks to the recent landmark case, *Campbell v. Acuff-Rose Music, Inc.*, in which the court ruled that the rap group 2 Live Crew was within fair use guidelines when it parodied Roy

Orbison's song "Oh, Pretty Woman." If the U.S. Congress adopts this provision, making fun of other people's songs will be precarious.¹⁸

Bottling up Information

Just as Berne delegates used this treaty to attack a recent U.S. Supreme Court case that defends parody and fair use, they used the convention to attack another landmark case, *Feist Publications, Inc. v. Rural Telephone Service Inc.* in 1991, and the fundamental principal behind it. In the *Feist* case, the U.S. Supreme Court ruled that a phone book company, regardless of the time, effort and money it invested in compiling a directory, could not claim copyright protection over the mere information in the text: alphabetized names, addresses and phone numbers. Conforming to the alphabet is not considered "creative" enough to qualify as an act of "authorship," the court ruled. However, it's safe to assume that the "now I know my ABCs; next time won't you sing with me" part could be protected by copyright. But in *Feist*, the court clearly stated the bedrock principal of American copyright law: You can protect specific expressions of

ideas, but not the underlying ideas themselves. You can protect the style and structure of "Casey at the Bat," that "there was no joy in Mudville," but not the awful truth that Casey did strike out.

To evade the "problem" that the U.S. Supreme Court generated among database companies -- that they fear others will copy their data electronically and sell it cheaper than they could -- European and American negotiators have been trying for several years to create a new form of intellectual property law that would consider databases protectable outside the constraints of American copyright law. They would not base this new form of intellectual property on the idea of "creativity" or "authorship," as in copyright law, but instead on the "sweat of the brow" principal: that any investment of time, effort and money warrants protection. The delegates at Berne delayed considering this third treaty to protect databases. But the European Union has already moved to protect them and the U.S. Congress has considered database legislation in 1997, 1998, and 1999.

By the late 1990s, data services were the sixth largest segment of the information industry. Database companies sell

texts of legal cases, government filings, telephone and address lists for direct marketing, voter profile lists, consumer profile lists, chemical information, geological data, and much more. Database providers collect more than \$100 billion per year for their services -- and that's without specific legal protection.¹⁹ Bruce Lehman, President Clinton's commissioner of Patents and Trademarks led the American delegation to Berne and has helped write and push the enabling legislation on the hill. He is on record supporting these changes as essential to the growth of a new and emerging American industry. Lehman told *The New York Times* in February 1997, "We are protecting people against theft of their intellectual property, not trying to stop fair use. If you're going to have people making large-scale investments in this new digital environment, they have to have some sense of security that they are going to be protected and make money on it." In other words, Lehman wanted to use federal and international law as protectionist measures to support one sliver of American industry. Protecting one industry raises costs and limits opportunities for everyone else. This is exactly what is happening with the data industry.²⁰

Opposing the database protection measures were representatives of underdeveloped nations who are concerned by the concentration of database access in Western nations, scientists concerned about easy and inexpensive access to data, and, of course, librarians. The proposed legislation, which is similar but in fact more stringent than the European Union pact, contains the following provisions:

- A database is subject to legal protection "if it is the result of a qualitatively or quantitatively substantial investment of human, technical, financial or other resources in the selection, assembly, verification, organization or presentation of the database contents, and the database is used or reused in commerce, or the database owner intends to use or reuse the database in commerce."

- Although government databases are not protected, and are free for anyone to use, privately owned databases compiled from government-generated statistics are to be protected.

- No person shall: "extract, use, reuse or a substantial part, qualitatively or quantitatively, of the contents of a database subject to this act in a manner that conflicts with the database owner's normal exploitation of the database or

adversely affects the actual or potential market for the database."

- No person shall: "engage in the repeated or systematic extraction, use or reuse of insubstantial parts ... in a manner that cumulatively conflicts with the database owner's normal exploitation of the database ..."

It's important to remember a few things when weighing whether this industry should get this special form of protection. First, the database industry has grown rich and powerful without a special law to protect it. Second, consumers will always pay more for the delivery -- quick and easy access to information -- than they would for the data itself. Delivery systems are proprietary and protectable by trade secret and unfair competition laws. And as more databases go on-line and link themselves to the Internet, they do so with elaborate and expensive gates. We cannot enter them without a permission and usually payment. They already have big gates to keep most of us out. They are almost perfect monopolies already. Further, much of the "data" these services provide is already protected by American copyright laws. For instance, a database of periodical articles has protection over the specific expression in each

article. Another layer of protection simply limits their potential uses.

How can this move to protect databases impinge on the way information is used in the world? Let's examine one small yet significant area that would be severely cramped by database protection: scholarship. Let's pretend I'm writing a book about American life between the World Wars, and I want to use some popular icons to represent major trends in American culture. I pick baseball Commissioner Kennesaw Mountain Landis to represent the Puritanical progressivism that drove the anti-immigration and anti-liquor movements. I pick Washington Senators pitcher Walter "Big Train" Johnson to describe the rising industrial and technological timbre of the times. I choose Yankee first baseman Lou Gehrig to exemplify the immigrant work ethic and the generational tensions alive in immigrant families. And, of course, I use George Herman Ruth to illustrate the excesses of the times. To write this book, and mainly because I would really be looking for an excuse to write about baseball, I would use a lot of statistics: how Babe Ruth did against Walter Johnson; how Lou Gehrig did against Johnson; how Ruth and Gehrig made each other better hitters and bitter rivals over time. In other

words, I would have to dip time and time again into the database of Major League Baseball statistics. This database is easy to get and easy to manipulate. You can get it on CD-ROM or in small, hand-held computers. Under traditional copyright law, my repeated use of information for a commercial purpose in this case would normally demand no permission and no payment. Information, at the end of the 20th century at least, was free and reusable. Only by reprinting in their entirety the statistical tables from the baseball record books and using the exact same format would I be infringing on a copyright.

Under the proposed treaty and law, however, I would have to request permission for each statistical cross-reference I make; I would have to pay a fee for each search I did, perhaps sign a contract that gave Major League Baseball a cut of my meager book royalties. I might even find permission to use the information denied if the commissioner's office found out that I oppose realignment, expansion, artificial turf, and expensive ballpark food. Imagine every newspaper, every sports magazine, every radio and television broadcast that covers major league baseball having to seek permission and pay a fee for statistical data on players.

Let's say a geologist at a private university gets a major grant through his institution and private foundations to do geological research off the coast of Alaska. This research could be valuable to both oil companies and to environmental interests. However, lawyers for the private university have insisted that databases compiled by university employees are the property of the university itself, so it can license the information to oil companies for a hefty fee. Regardless of the geologist's best intentions, her work could not be used freely, accessed easily, criticized or tested. Her research would produce a small short-term gain for the institution, but no long-term gain for science or the environment. And if her work is imperfect and no one verifies her findings, it might even mess up the oil companies. If Jane's handbooks of military vehicles, weapons and equipment become restricted databases, debate over military expenditures might dry up.²¹

As John Dewey wrote, "No scientific inquirer can keep what he finds to himself or turn it to merely private account without losing his scientific standing. Everything discovered belongs to the community of workers. Every new idea and theory has to be submitted to this community for confirmation and test."²²

This process of collecting raw material from a group of people, processing, refining and arranging it, and then selling it back to them at monopolistic prices is intellectual mercantilism. Just like the East India Company used the British government to support its program to collect Indian rock salt and sell table salt back to Indians, the database company Reed-Elsevier has been using the power of the U.S. government to achieve an operational monopoly around the world so that the world must turn to Reed-Elsevier to find out about itself. This is a new imperialism -- an imperialism without borders. Companies with the capital to assemble and license facts and data can control dissemination to those unblessed with capital. Whether the unblessed includes a fifth grader in South Africa who walks 10 miles to a library with an Internet connection or researchers at universities, these companies will be able to price most consumers out of the information to encourage scarcity and drive up demand. In addition, these companies will be able to choose who may gain access to and use their information.

So what we are seeing on the horizon is the potential perfection of monopolies. Database companies will not only

control and charge for any repeated use of their information, but will hold the keys to it as well. On an international level, "intellectual property" law is being used as a weapon in protectionism. We've seen several moves in this direction in the last 10 years: Digital Audio Tape legislation, the Semiconductor Chip Protection Act of 1984, the European Union database protection, and the subsequent American response with even stronger database protection.

And there is one more scary aspect of database protection. The duration of protection under both the European and American proposals is potentially infinite. Databases would be protected for 25 years under the American plan, but that term is renewable every time more data is added. In other words, the baseball statistical database would renew its protection every season, possibly every game. This directly violates the enabling clause of the Constitution that governs "intellectual property." The clause specifically calls for a "limited" duration of protection for patents and copyrights.²³

The electronic networks that should be the great democratizers could just as easily kill inquiry, expression, and debate around the world. Fortunately, Congress had balked at

passing the enabling legislation for the unsigned database protection treaty through the late 1990s.

"Recycling" the Idea-Expression Dichotomy

In the bottom-right corner of the computer screen on which I am writing this sentence sits the image of a garbage can. It's an icon, a functional part of the "graphical user interface," or GUI, that the Apple Computer company developed for its Macintosh line in the early 1980s. Even though this icon resembles any common aluminum trash can one might see on a curbside or around Oscar the Grouch on Sesame Street, it is a highly protected part of Apple's array of copyrighted materials. If you are like nine out of ten personal computer users in the United States, you have a different icon on the left side of your computer screen. You have a green "Recycle Bin", a functional part of the Microsoft Windows operating system since 1995. Both of these operating systems share other icons such as folders, drop-down (or pop-up) menus, and dog-eared documents. And both GUIs have bins into which one can drag unwanted items. Yet one bin is marked "Trash" and the other is marked "Recycle Bin." This is a

trivial, superficial difference between the systems. But the difference is a vestige of a string of controversies and cases that marked and perhaps determined the development of the personal computer and the proliferation of digital technology in daily life.

While recent global moves to protect data with sui generis intellectual property protection threaten the foundation of the idea-expression dichotomy, the conflicts that created more recycling bins than trash cans on our computer screens have actually worked to revive and reinforce the dichotomy -- at least in the area of software design.

The tenuous revival of the idea-expression dichotomy begins with the phenomenal success of Pac-man, a video game that Midway Manufacturing Company licensed and introduced to the United States at the dawn of the Reagan era. Within months of its arrival from Japan, the "wocka-wocka-wocka" sound of upright Pac-man machines rang through the corridors of shopping malls and bowling alleys across the North America. The idea behind Pac-man was rampant consumption. The player controlled a joystick that guided a yellow circle around a maze. As the circle moved, it opened up like the jaws of an egg-snake,

gobbling small points of light. Each point of light yielded minimal points for the player. Many more points came from eating the larger "power pill" that sat in four corners of the maze. When the Pac-man image ate a power pill, the four ghosts that were charged with chasing the Pac-man and defending the maze would turn colors and become edible as well. If the ghosts - Inky, Blinky, Pinky, and Clyde -- were in their normal state and color, they chased the Pac-man. If the ghosts caught the Pac-man, the Pac-man would wither and die with a pathetic "woo-woo-woo-woo" sound. If the Pac-man were energized, he would chase the ghosts. If the Pac-man consumed one of the four ghosts the player earned bonus points. If a Pac-man cleared a maze of all the points of light, he would move up a level to a more difficult maze with faster ghosts. Within a few weeks of regular play, young people discovered that there were certain patterns that would allow easy victory. There were even "blind" spots programmed into the maze, where a Pac-man could hide unmolested by the aggressive ghosts. For a 25-cent charge, a skillful and devoted young person could play the game infinitely.²⁴

Pac-man wizards owned the video-game parlors in the early 1980s. The skilled players monopolized the machines to such a

degree that Midway - yearning for more quarters -- soon had to roll out other versions of the game with different patterns to success. Chief among these new authorized versions was the oddly named "Ms. Pac-man." And soon thereafter Midway licensed the home version of Pac-man for the popular Atari home game system. But soon after the authorized Atari version hit store shelves, another company, North American Phillips Consumer Electronics Corp., released a similar game cartridge for the long-forgotten Magnavox Home Entertainment Center game system. It was called "K.C. Munchkin." The Phillips version featured a maze, points of light, power pills, and monsters that would chase and flee from K.C. Munchkin. There were some minor aesthetic differences between K.C. Munchkin and Pac-man. K.C. Munchkin was green, not yellow. And he had horns and eyes. Pac-man was a simple, elegant yellow circle - and a ruthlessly efficient munching machine.

With fond memories of H.R. Pufnstuf and McDonaldland fresh in their minds, lawyers for Atari and Midway filed suit against Philips and Magnavox, expecting the trial court to invoke the troublesome "total-concept-and-feel" principle immediately and issue a preliminary injunction against the sale of K.C. Munchkin. But the trial court instead focused on the minor

differences between the two interfaces and ruled that the general idea of a "maze-chase" game is not protectable. Reviewing the request for an injunction, the Seventh Circuit Court of Appeals also ruled that Atari could not protect general attributes such as mazes, dots, and scoring systems. But the court ruled that maze-chase games did not necessarily require the presence of ghosts and the act of gobbling such ghosts. The court concluded that any ordinary observer would see that K.C. Munchkin was substantially similar to Pac-man. Therefore, it issued a preliminary injunction against K.C. Munchkin. The Seventh Circuit seemed to making the world safe for maze-chase games. But in fact, no other competitors to Pac-man's dominance emerged in ensuing years. Mazes without Inky, Blinky, Pinky, and Clyde seemed empty, soulless, and silly.²⁵

Video games were among the most lucrative and popular software products in the early 1980s. But personal computer operating systems were clearly emerging as valuable business tools, and thus potentially worthy of high levels of protection as well. Congress had in 1976 added computer programs to the list of copyrightable works, but courts had not sorted out the limits and principles that would guide software developers.

Specifically, was an operating system -- the guts, heart, and mind of a computer -- protectable as an original work of authorship or was it part of the machine itself, and thus purely functional?

Among early personal computer operating systems, the Apple II had a clear edge. It was cool, flexible, useful, and fun. It had brand recognition over such early competitors such as Commodore and Tandy. Many hobbyists were developing business and game software for the Apple. By 1981, Apple employed more than 3,000 people at its headquarters in Cupertino, California, and enjoyed \$335 million in sales. The code for the Apple II operating system was inscribed on silicon chips inside the processor, in what is called read-only memory, or ROM. Unlike its cousin random access memory, or RAM, ROM can't be modified, deleted, or upgraded by users. With the success of the Apple operating system, the company had little incentive to license it to other computer makers. If customers wanted to use an Apple, they had to buy the whole box. And Just like with the Pac-man phenomenon, soon a second-comer decided to compete directly with Apple.²⁶

Franklin Computer Corporation had the idea to market a cheaper version of an Apple II. The Franklin Ace 100 looked like an Apple II, and it had a similar operating system.

Unfortunately for Franklin, the system was so similar that the code contained several clues to its origin. Clearly, the engineers at Franklin had gone farther than reverse-engineering the Apple operating system. They had copied major portions of it.²⁷

Apple lost the first round in its copyright suit against Franklin. The trial court refused to grant an injunction against the Ace 100 because it was confused about whether both source code and object code were protectable expressions. Programmers produce source code in commonly used languages such as COBOL, Pascal, or C++. Then the computer uses its "compiler" to translate those expressions into object code, in what is often called "machine language." The trial court concluded that object code, unreadable by human beings, cannot be "expressive" for the purposes of copyright protection. Being the purest form in which one may render ideas, object code is close to being a collection of ideas themselves. In addition, the court was troubled by the fact that the object code was embedded on ROM chips, which might

not count as a "tangible medium of expression" as the copyright law demands. After all, the medium of silicon chips is not immediately "tangible" to human eyes. But the appellate court reversed the trial court decision in August 1983, granting Apple an injunction. The appeals court could not insert a distinction between source code and object code in the language Congress had written into the copyright law, which defined a "computer program" as "a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result." And the appeals court ruled that ROM was just as "tangible" as magnetic discs or tape. Third, the court ruled that even though a computer program is purely "functional," the umbrella of copyright would still cover it. Emboldened by this victory, Apple arrogantly surged on, enjoying its fleeting dominance of the personal computer business, refusing to license its operating system to other hardware companies until well into the 1990s. Had Franklin prevailed, copyright protection for functional software would have been extremely weak. Other competitors to the Apple II would have sprung up immediately, and operating systems based on the core of the Apple system

might have become the standard for personal computers for many years.²⁸

But instead, a smaller, lighter company - one that dealt exclusively in software, took over desktops all over the world. Microsoft triumphed not only through bullying, intimidation, clear restraint of trade, predatory takeovers, brilliant public relations, a Rolling Stones' song, and other deft business moves, but by exploiting what was left of the idea-expression dichotomy at the end of the 20th century.

Back before 1984, all personal computers relied on textual interfaces. Whether using the archaic CP/M, Microsoft's MS-DOS, or an Apple II, users had to know specific command codes to retrieve and manipulate files. The computer would offer a "prompt," and the user would instruct the computer to "run," "save," or "delete." But some clever engineers at Xerox Corporation's Palo Alto Research Center, or PARC, saw another way. They envisioned - and invented, the graphical user interface, or GUI. A GUI would appear as a "desktop." Users would see open files and running applications as "windows." Pushing a "mouse" on a tabletop would move a "cursor" along the screen. Clicking on an "icon" would launch an application or

open a document. Xerox developed the GUI, but it did not exploit it for commercial gain. Instead, it let the revolutionary engineers of Apple in the front door to see how it worked.²⁹

In August of 1979, Steve Jobs, the once and present chairman of Apple, led a small crew of his programmers into PARC to check out the new developments within. In exchange for access to the labs, Jobs had sold to Xerox 100,000 shares of Apple stock for \$1 million. Among all the gadgets and tricks on display, Jobs and his team were transfixed by the demonstration of the GUI. They asked for a detailed explanation of how it worked, and the Xerox programmers explained "bitmapping" to them. What these Xerox computers were doing was assigning each pixel on the screen to a specific bit on the processor's chip. That bit would light up its pixel on command, and the resultant illusion was a cartoon desktop on a screen. Bitmapping required huge assignments of memory to the display function. But if memory and processing speeds could support it, Jobs realized, the GUI could revolutionize computer use. At least it could be the key to maintaining and extending Apple's dominance in the blossoming personal computer industry. Since the development of the Apple II, giant IBM had agreed to license Microsoft's MS-DOS

for its line of business desktop computers. Despite the clear technical and aesthetic superiority of Apple products, the business world steadily gravitated to the familiar blue logo of IBM. But Jobs assumed that if Apple could roll out a marketable graphical user interface, the entire game would change. Many people in the 1980s were still wary of using computers. And the textual interface reminded users of the secret code that computer specialists used. So Jobs sent his programming teams on a Quixotic quest to develop a new way for humans to extend their perceptions through machines.³⁰

After the disastrously premature introduction of the \$12,000 Lisa computer in 1983, Apple put all its hope in a slicker, more friendly system by 1984: the Macintosh. It changed the world.

Meanwhile, up the Pacific coast in Redmond, Washington, software engineers at Microsoft were busy rolling out inferior versions of other people's inventions. The 1980s and early 1990s not only saw the proliferation of MS-DOS on an increasing number of machines. It saw the introduction of a cumbersome Microsoft version of the superior and popular word processing program WordPerfect, a Microsoft version of the revolutionary

spreadsheet program Lotus 1-2-3, and ultimately a windows-and-mouse-based graphical user interface dubbed with a powerful generic name, Windows.³¹

When Microsoft sought to introduce a GUI as early as 1985, Apple agreed to license some Macintosh design features to Microsoft. But Microsoft did not specifically purchase license particular icons such as the trash can. Nor had Apple licensed the use of items such as tiled windows for subsequent upgraded versions of Microsoft Windows. Angry that Microsoft had apparently extended its ambitions beyond their licensing agreement, Apple filed suit in 1988 against Microsoft over its Windows 2.03 and 3.0 versions, claiming specific contractual abrogations and a general copyright infringement on the "look and feel" of the Macintosh system. Two trial court judges ruled against Apple, deciding that many of the questionable features were either covered by the license agreement or so common and obvious as to be considered part of the public domain. The first trial judge, Judge William Schwarzer, drew the line of infringement so tightly that an operating system would have to be "virtually identical" to an original system to infringe. The second, Judge Vaughn Walker, ruled that many of the features in

dispute between the two operating systems were "purely functional" and intuitively necessary for any graphical user interface. Walker compared the use of file folders and drop-down menus to dials and knobs on a television set. Standardization is not copying. To allow Apple to protect its "look and feel" would be to stifle any competing operating system, better or worse.

These court rulings allowed Windows to grow, while just a few years before a very different and much broader decision had killed off K.C. Munchkin and all potential competitors to Pac-man. By 1994 an appeals court agreed with the trial court's ruling, making the computer world truly competitive, at least at the level of interface design. Not coincidentally, by the time the appeals court ruled, Microsoft was almost ready to roll out Windows 95, its most dynamic and user-friendly GUI operating system up to that time. Microsoft clearly felt legally safe competing directly with Macintosh by selling a very Mac-like interface. But just to be safe, Windows still features a recycling bin instead of a trash can. Microsoft started the 1990s relatively copyright poor. It successfully exploited the idea-expression dichotomy and used it as a wrench to break Apple's hold over the user-friendly computer market. And in 2000

Microsoft - now copyright rich -- continues to recycle other people's ideas into their own monopolistic empire while fighting to maximize copyright enforcement and control around the globe.³²

Codifying the Digital Moment

As the software wars show, the idea-expression dichotomy was still relevant but certainly in flux by the late 1990s. A strong defense of the dichotomy had allowed for healthy (and later unhealthy) competition between Apple and Microsoft. But a strong push on behalf of database companies continued to threaten the principle behind the dichotomy: that facts and ideas should flow freely (in both senses of "free") while creative arrangement and expression should deserve limited monopoly protection. On several other copyright fronts, courts, Congress, and international governing institutions were steadily strengthening the power and scope of copyright protection with little or no regard for the effects these changes would have on democracy and creativity.

The best example of legislative recklessness is the Digital Millennium Copyright Act of 1998, the enabling legislation for

the WIPO copyright treaty. The Digital Millennium Copyright Act has one major provision that upends more than 200 years of copyright law. It puts the power to regulate copying in the hands of engineers and the companies that employ them. It takes the decision-making power away from Congress, courts, librarians, writers, artists, and researchers. The DMCA:

- Prohibits the circumvention of any effective technological protection measure installed to restrict access to a copyrighted work.

- Prohibits the manufacture of any device, composition of any program, or offering of any service that is designed to defeat technological protection measures.

- Orders the Librarian of Congress to conduct rulemaking hearings to judge the effects the law would have on non-infringing uses of copyrighted material.

- Specifically allows certain uses such as reverse engineering, security testing, privacy protection, and encryption research.

- Makes no textual change to the fair use provisions of the Copyright Law, despite eliminating the possibility of

unauthorized access to protected materials for fair use purposes.

- Limits the liability that online service providers might face if one of their clients were circumventing or pirating.

Before Congressional committees and in hearing held by the Copyright Office of the Library of Congress, public interest advocates such as law professors, electronic civil liberties activists, and librarians outlined some concerns and objections about the DMCA. These include the possibility that the DMCA makes it possible to levy fees for various uses that might otherwise be "fair" or "free," such as parody and quoting for news or commentary.

In addition, the DMCA erodes the "first sale doctrine." When a work is sold, the copyright holder relinquishes "exclusive" rights over it yet retains "limited" rights, such as restricting copying or public performance. But under the first sale doctrine, the consumer can highlight a book, copy portions for private, non-commercial use, resell it to someone, lend it to someone, or tear it up, without asking permission from the copyright holder. Because the DMCA allows content providers to regulate access and use, they can set all the terms of use. And

much like the database protection proposal, the de facto duration of protection under the DMCA is potentially infinite. While copyright law in 2000 protects any work created today for life of the author plus 70 years or 95 years in the case of corporate "works for hire," electronic gates do not expire. This allows producers to "recapture" works already or about to fall in the public domain. This also violates the constitutional mandate that Congress copyright laws that protect "for limited times." Most dangerously, producers could exercise editorial control over the uses of their materials. They could extract contractual promises that the use would not parody or criticize the work in exchange for access. Many web sites already do this. Just as dangerous, the DMCA allows producers to contractually bind users from reusing facts or ideas contained in the work. If a user wants to hack through access controls to make legitimate fair use of material inside - perhaps facts, an old film in the public domain, or pieces of the work for commentary or news, that user is subject to civil and criminal penalties under the DMCA.³³

Making an Example of Hackers

As librarians, industry representatives, and copyright office staff at the Library of Congress debated the effects of this law during the summer of 2000, the Motion Picture Association of America was already fast at work trying to make an example out of those who might challenge it. The motion picture industry's newest format, the Digital Video Disc, has two important access control features: a Content Scrambling System (CSS) and a Region Code, which ensures that users can only play U.S.-purchased DVDs on U.S.-purchased DVD players. Without the properly licensed DVD player from the right region of the world, a DVD will not play. Not surprisingly, some companies such as Sony produce both motion pictures and the machines one must play them on. The motion picture industry negotiated licenses with producers of stand-alone DVD players and with both Apple and Microsoft so that computers running these operating systems could descramble the code on DVDs. But in 1999, one could not use a computer that runs on the open-source Linux operating system to run DVDs. So some programmers who use Linux created and distributed a small computer program called DeCSS, which hacks through the CSS and region code

protection and deposits unscrambled data from DVD to a hard drive. DeCSS was invented by a team of creative and independently minded European programmers led by Jon Johanson, a 16-year-old Norwegian.³⁴

Soon after an on-line hacker magazine called *2600* started alerting its reader as to where they could get a copy of DeCSS, the Motion Picture Association of America got an injunction against it in Federal Court in New York. As the case went through to trial in the summer of 2000, the Electronic Frontier Foundation and the Berkman Center for Internet and Society at Harvard Law School began assisting the publisher's defense counsel to formulate a strategy to protect the journal's First Amendment rights in the face of a suit based on the anticircumvention provisions of the DMCA. Their arguments - which failed to persuade the federal judge - included the argument that DeCSS can be used for non-infringing purposes such as fair use viewings of DVDs from other countries. They also argued that because CSS can be used to protect material in the public domain, the DMCA is too broad.³⁵

Public interest advocates also argued that Congress had left the definition of a protective "device" up to the copyright

holder. The DMCA lets companies "write" the law, then puts the power of the state behind them. But the Copyright Clause of the U.S. Constitution only gives Congress the right to design copyright laws. It cannot delegate lawmaking authority. Underlying all of these concerns is one that should have dominated the discussion in 1998: If pirating is already illegal, why do we need this law? Congress decided it was easier to regulate machines than people. The DMCA was not only the enabling legislation for the WIPO treaties. It is the enabling legislation for the "Celestial Jukebox," the "pay-per-view universe," and what Neil Postman calls "Technopoly."

A Pay-per-View World

As Neil Postman writes, "Technopoly is a state of culture. It is also a state of mind. It consists in the deification of technology, which means that the culture seeks its authorization in technology, finds its satisfactions in technology, and takes its orders from technology." Postman was describing a condition, technopoly, which he defines as "what happens to society when the defenses against information glut have broken down. It is

what happens when institutional life becomes inadequate to cope with too much information. It is what happens when a culture, overcome by information generated by technology, tries to employ technology itself as a means of providing clear direction and humane purpose." Among the defenses Postman cites are schools, courts, and the family. Postman didn't mention it at the time, and he perhaps had not even considered it, but copyright law is a system - an institution of practices and habits - that regulates information by creating artificial shortages for limited times and for limited purposes. It's an imperfect and sometimes inefficient mechanism to regulate information. But its imperfections and inefficiencies were its strengths, its democratic safeguards. And now, more through political intervention than technological irrelevancy, we find ourselves unwilling to accept the imperfections and inefficiencies inherent in copyright law. Now we turn to technology. We turn to code.³⁶

As Lawrence Lessig writes, when code, not human beings, regulates copyright, the system forfeits its checks and balances. "As privatized law, trusted systems regulate in the same domain where copyright law regulates, but unlike copyright

law, they do not guarantee the same public use protection. Trusted systems give the producer maximum control - admittedly at a cheaper cost, thus permitting many more authors to publish. But they give authors more control (either to charge for or limit use) in an area where the law gave less than perfect control. Code displaces the balance in copyright law and doctrines such as fair use."³⁷

But copyright is already being replaced - or supplemented - by contract. Most commercial software and much digital content comes with what is known as a "Clickwrap" or "Shrinkwrap" license. Users often agree to waive rights, such as fair use and first sale, when they click on a web page button to get access to the content. For example, the site for Billboard.com charges its users \$14.95 per month to get access to data on sales within the music industry. For that fee, members get to view five articles for no extra charge. But in addition to the monthly fee, Billboard.com charges its members from 50 cents to \$2.50 per article or database view after the five free views. Much of the information within the gated web site is not available in print form. But researchers who use the Billboard.com site are contractually forbidden from disclosing the information they

retrieve. The user license agreement states, "Unless separately and specifically licensed to do so in writing and by BPI (Billboard's online servicing company), subscriber agrees not to re-transmit, disclose, or distribute any of the information received from the service, to any other person, organization or entity." In other words, paying users must sign away their rights to fair use. Because there is no "sale" in the transaction, there is not concept of first sale. And the user is contractually forbidden from exploiting the idea-expression dichotomy. And users who choose not to pay for the information, those who hack through the web site lock to read the articles within are subject to civil and criminal penalties through the DMCA. The Billboard.com system is protected by copyright plus contract plus code.³⁸

Commercial software, even software distributed in compact disc form, is protected by similar licenses. Even though it might seem that when you spend money on software, you are buying a physical compact disc, you are actually only renting a license to use the encoded software. Consumers sign away fair use and first sale rights with regularity. It's a pay-per-install system

that potentially allows for metered usage or even the electronic expiration of the software.

Many of our cultural products will soon be "triple-protected" by copyright, contracts or licenses, and code. Therefore, they will be "closed systems," limited in their ability to enhance the public domain or enrich the public sphere.

Napster Nation

But citizens are fighting back against these methods of digital and cultural control. The best example of this is the proliferation of peer-to-peer networks. The most famous of these networks is the music-sharing system called Napster. Napster was invented by a teenage college student named Sean Fanning. Fanning was living in Boston and spending a lot of time surfing the Internet in search of MP3 files. He grew frustrated with the sporadic availability of MP3s on the World Wide Web. So he hacked the software that allows people to peer into each other's hard drives to find and copy specific MP3s. The company he

founded, Napster, has attracted million of dollars in venture capital, millions of users, and more than its share of lawsuits.

In July 2000 Napster went to U.S. District Court in San Francisco to defend itself against a barrage of plaintiffs, including legendary composer Jerry Lieber and all the major record labels. The plaintiffs claimed that Napster is liable for contributory copyright infringement because it enables thousands of people to share and copy MP3s for no cost. The companies hope to plug up this leak in the music distribution system. The companies would like to distribute their music electronically, but in a format they control, under terms they dictate, for a price they can enforce.³⁹

While Napster has frightened the music industry and attracted the attention of every major news organization, it is not the whole story. The issue is much larger than the fortunes of Napster itself. Even if a court shuts Napster down, the MP3 movement will thrive. And even if Napster survives, it's not so clear that people will stop buying CDs just because they can get free MP3s one song at a time. But regardless of the outcome of this case, the music industry will never be the same again.

The MP3 movement is a rational revolt of passionate fans. Compact Discs cost too much. Cutting-edge fans want the newest, coolest music as fast as possible. So they share music and tips about music where they find each other -- over the net. The free music strategy is, for lack of a better term, the Grateful Dead business model: Give away free music to build a loyal following, establish a brand name, and charge handsomely for the total entertainment package. Whole creative movements have established themselves through this process of community building. In the late 1970s, Downtown New York punk fans found each other and discussed emerging artists through the handmade fanzines given away at the few clubs willing to host punk shows. At the same time, uptown in the Bronx, the Hip-Hop movement was spreading through a network of fans who would copy and lend tapes of artists like Grandmaster Flash and Kurtis Blow. Free music has always been essential to the discursive communities that fuel the creative process. These days, some small music labels such as Emusic.com and Chuck D's Rapstation.com are experimenting with "value-added" and "gatekeeper" business models, with modest taxation on consumers and artists (and thus modest profit potential). They depend on open systems, like the Internet

itself, to foster creativity and "buzz" about their products and services.

MP3 distribution offers a wonderful opportunity for emerging artists, the very people copyright law is constitutionally charged to encourage and aid. Because the established music industry narrows the pipes of production and distribution, manufacturing scarcity, only established artists profit from the old system.

This new technology evades the professional gatekeepers, flattening the production and distribution pyramid. As Chuck D of Public Enemy says, Napster and other such networks are not pirating machines. He posits that Napster is radio. Fans will continue to download cheap or free music, and will continue to buy CDs if they offer value like documentation, design, arrangement, and convenience at a reasonable price.

There is another metaphor that might explain Napster and its effects better than a copy machine or a user-programmed radio: Napster is a public library

Regardless of the direct effect on CD sales, MP3 distribution makes music fans more informed consumers. In the

long run, the music industry could be more responsive to margins of the market, such as ethnic communities, subcultures, and political movements. Consumers can only express their preferences rationally if they enjoy good information and a fair pricing structure. MP3s let consumers taste before they buy, and let them act in concert with like-minded fans. They let music companies react instantly to changes in the market place. With better feedback, apparent "trends" would not surprise companies in the future.

The charm of digital music distribution lies in the thought of capitalist theorists such as Freidrich von Hayek and Edwards Deming. The current mainstream music industry is a "planned economy," the sort Hayek railed against. It limits information flow and resists price pressures. And Deming advocated constant change, flexibility, new ideas, flat organizational structures, quick reactions to customer preferences, and maximum creativity.⁴⁰

The MP3 phenomenon is a battle of control of the music and information pipelines, not the music itself. Since December 1999, several other Napster-like services have emerged on the net. Unlike Napster, these are non-commercial and community

based. They depend of volunteer programmers to fix and improve the open systems. And unlike Napster, privacy is pretty much assured - for now. No one has any idea who else is using these services.

One of these relatively open systems is called Gnutella. Several versions exist, at least one for every common computer platform. Unlike Napster, one needs no password to use it and it has no registration process. Also unlike Napster, Gnutella lets users share all kinds of files -- text, video, photos, software, and music. No one "runs" or "owns" Gnutella. Gnutella is a new kind of Internet. But it's really what the old Internet was supposed to be. It's free, open, decentralized, uncommercializable, ungovernable, and uncensorable.⁴¹

The rise of MP3 formats and free, open networks like Gnutella should have been expected. The culture industries invited them. They have hijacked the copyright system and drained it of any sense of public interest or balance. Copyright is an essential state-granted monopoly that works well when balanced. Thanks to the Clinton administration and its partnerships with big media companies, it has lost its balance. What the content industries have claimed is a "crisis" of

digital reproducibility is actually the opportunity they have been dreaming of.

The music industry has been stalling through litigation until it can establish a standard secure digital encryption format, which is an essential step toward a global "pay-per-view" culture. This technocratic regime will be a severe threat to democracy and creativity around the world.⁴²

The important struggle is not bands vs. fans, or even Time Warner vs. pirates. It involves the efforts of the content industries to create a "leak-proof" sales and delivery system, so they can offer all their products as streams of data triple-sealed by copyright, contract, and digital locks. Then they can control access, use, and ultimately the flow of ideas and expressions. The content industries have been clear about their intentions to charge for every bit of data, stamp out the used CD market, and crush libraries by extinguishing fair use. In early July 2000 America Online signed a deal with a digital rights management system called InterTrust. InterTrust will provide the encryption and decryption technology to AOL's software so that AOL users will endure metered and regulated use of digital music, film, text, and everything else. And other

digital music services are struggling to settle cases with the record industry so they can "partner" to install electronic "digital rights management" controls on their music.⁴³

The reason the culture industries can take advantage of the "Digital Moment" to trump the democratic process and write their own laws is that digital formats collapse the distinction between using material and copying material. Because regulating reading or listening raises deep First Amendment concerns, courts have been unwilling to do so until now. However, copyright law regulates copying. So digital distribution allows a higher level of regulation than we ever imagined. Soon we could have to apply for a license to listen or read, and the rule of law will no longer apply. America Online will be the cop, jury, and judge in matters of copyright.

The End of Copyright?

In the summer of 2000, as the conflicts over Napster occupied front pages of newspapers and magazines across the nation, the public started asking itself some difficult questions about the nature and future of copyright. One of the

most interesting of these discussions happened in the on-line news magazine *Slate*, which is owned by the copyright-rich Microsoft Corporation. *Slate* writer Robert Wright published two pieces that asked what music and literature might look like in a "post-copyright" age. Wright was not willing to declare copyright dead yet. He still saw that copyright holders had weapons of enforcement at their command. But the thought intrigued him. Flashing back to John Perry Barlow's predictions from 1996, Wright found that Napster and other peer-to-peer networks might actually create the necessary libertarian environment that could render copyright irrelevant. Wright predicted that performers would be pressed to add value through liveness, and through high-quality technical delivery, rather than through the enforcement of a temporary monopoly over content. If consumers want stuff, they could get it for free. If consumers wanted good stuff, they would have to pay for it. And in the book industry, Wright predicted that for authors who could also perform -- motivational speakers, for instance -- money would still be forthcoming. The post-copyright economy would be brutal to many musicians and writers, and kind to others. Wright did not offer a sophisticated analysis of the

role copyright plays in a democratic culture or the matrix of technological initiatives involved in the issue. He viewed it only in terms of the financial reward for artists. But the most interesting observations came from "The Fray," the on-line discussion that follows articles in *Slate*. Many readers who wrote in to "The Fray" were upset that Wright seemed so cavalier about the effects Napster might have on recording artists. Others were indignant about the arrogance of the record companies. Some readers declared copyright dead, so we should just forget about it and rejoice in the prospect of a future without big music labels. Others declared copyright untenable in the digital era, and called for the strongest possible digital protection schemes. Still others declared copyright a natural right that emanates from the act of artistic creation. Napster had generated more than panic and glee. It had sparked some serious and sometimes nuanced discussion of copyright issues in the public sphere.⁴⁴

Two years before Napster alerted the general public to the turmoil within the copyright system, American University law professor Peter Jaszi gave a speech he called "Is This the End of Copyright as We Know It?" In this talk, Jaszi argued that

copyright was being displaced by three much stronger, almost leak-proof systems that he called "pseudo-copyright," "paracopyright," and "metacopyright." "Pseudo-copyright" stood for data protection efforts. "Paracopyright" described the technological locks that would soon encase much digital content. And "metacopyright" stood for the system of contractual rights surrender. Jaszi concluded that the American tradition of "balanced" copyright had been very successful. He credited it with stimulating competition among content companies while nourishing a not-for-profit cultural sector that includes libraries, universities, and think tanks. Jaszi did not predict the demise of copyright. He outlined the initiative that content companies had been taking for years before anyone had dreamed of peer-to-peer distribution. The end of copyright was visible long before the general public became aware of it.⁴⁵

What James Madison and American jurists have known for centuries is that a leaky copyright system works best. When properly balanced, copyright allows users to enjoy the benefits of cultural proliferation at relatively low cost through a limited state-granted monopoly. Libraries help that process by letting the wealthy subsidize information and for the poor. And

a thin, leaky copyright system allows people to comment on copyrighted works, make copies for teaching and research, and record their favorite programs for later viewing. Eventually, a copyright runs out, and the work enters the "public domain" for all of us to enjoy at an even lower cost. But when constructed recklessly, copyright can once again be an instrument of censorship, just as it was before the Statute of Anne.

¹ Herbie Hancock is now committed to closing the "digital divide." He founded the Rhythm of Life Organization in 1996 to fund technological programs for underprivileged communities. For information on Herbie Hancock's Rhythm of Life Foundation, see <http://www.imhotech.com/rolo/>.

² <http://www.net.org/html/history/detail/1983-midi.html>

³ Al Willis, Nicole Hampton, and Adam Wallace, "MIDI: A Beginners' Guide," <http://www.mtsu.edu/~dsmitche/rim419/midi/HTMLs/MIDHIS~1.HTM>

⁴ Herbie Hancock, "Cantaloupe Island," *Empyrean Isle* (New York: Blue Note Records, 1964). Us3, "Cantaloop," *Hand on the Torch* (New York: Blue Note Records, 1993).

⁵ Paul Goldstein, *Copyright's Highway: The Law and Lore of Copyright from Gutenberg to the Celestial Jukebox* (New York: Hill & Wang, 1994). p. 197.

⁶For a brief account of the controversies over software patents, which became available only in the late 1980s, see James Boyle, *Shamans, Software, and Spleens: Law and the Construction of the Information Society* (Cambridge: Harvard University Press, 1996) pp. 132-134. also see Andrew Chin, "Computational Complexity and the Scope of Software Patents," in *Jurimetrics* 39, Fall 1998. pp. 17-27. Among the best work on software patents and the idea of a *sui generis* area of "intellectual property" for software is Pamela Samuelson et al., "A Manifesto Concerning the Legal Protection of Computer Programs," in *Columbia Law Review*, 1994.

⁷ John Perry Barlow, "The Economy of Ideas: Everything You Know about Intellectual Property is Wrong," in *Wired*, March 1994.

⁸ For an account of Richard Stallman's influence on the "Open Source" or "Free Software" movement, see Peter Wayner, *Free for All: How Linux and the Free Software Movement Undercut the High-Tech Titans* (New York: Harper Business, 2000). Also see the Salon Free Software Project at www.salon.com.

⁹ Richard Stallman, "The GNU Manifesto," at www.gnu.org/gnu/manifesto.

¹⁰ Stallman, "What is Free Software," at www.gnu.org/philosophy/free-sw.html.

¹¹ Stallman, "What is Copyleft," at www.gnu.org/copyleft/copyleft.html.

¹² Paul Goldstein, *Copyright's Highway: The Law and Lore of Copyright from Gutenberg to the Celestial Jukebox* (New York: Hill and Wang, 1994), pp. 199-236.

¹³"Intellectual Property and the National Information Infrastructure: The Report of the Working Group on Intellectual Property," September 1995. See Boyle, pp. 132-143. Also see Pamela Samuelson, "Legally Speaking: The NII Intellectual Property Report," in *Communications of the ACM*, December 1994.

¹⁴For an explanation of the Madisonian intentions for copyright law to encourage free and rich speech, see Netanel, pp. 292-386.

¹⁵For a brief outline of the three treaties, see Eric Schwartz, "International Outlook: Impact of the Two new WIPO Treaties," in *The Intellectual Property Strategist*, January 1997. p. 1. For an in-depth examination of how both dangerous and unnecessary the

database treaty is, see J.H. Reichman and Pamela Samuelson, "Intellectual Property Rights in Data?," in *Vanderbilt Law Review*, January 1997. pp. 49-166.

¹⁶Jukka Liedes, "Copyright: Evolution, Not Revolution," in *Science*, April 11, 1997. p. 223.

¹⁷See Julius Marke, "Database Protection Acts and the 105th Congress," in *New York Law Journal*, March 18, 1997. p. 5. For a brief summary of Moral Rights, see Paul Goldstein, *Copyright's Highway: from Gutenberg to the Celestial Jukebox*. New York: Hill and Wang, 1994.

¹⁸*Campbell v. Acuff-Rose Music, Inc.*, 1994. For the "Chicago School" or "Law and Economics" critique of parody and fair use, see Richard Posner, "When is Parody Fair Use?" in *Journal of Legal Studies*, 1992.

¹⁹Susan Nycum, "Protection of Electronic Databases," in *The Computer Lawyer*, August 1997. p. 12.

²⁰Carol Levin and Don Willmott, "Is It Mine On-line?," in *PC Magazine*, February 4, 1997. p. 30.

²²John Dewey, *Individualism, Old and New* (New York: Capricorn Books, 1962) p. 154. My thanks to Neil Netanel for tipping me off to Dewey's influence on how intellectual property intersects with democracy. See Neil Weinstock Netanel, "Copyright and a Democratic Civil Society," in *The Yale Law Journal*, v. 106, November 1996, p. 349.

²³ United States Constitution, Article I, section 8.

²⁴ For an introduction to the fascinating world of Pac-man, see www.gamecenter.com.

²⁵ Atari, Inc. v. North American Philips Consumer Electronics Corp., 672 F. 2d 607 (7th Cir. 1982). For the legal background to the Pac-man disputes, see Lawrence D. Graham, *Legal Battles that Shaped the Computer Industry* (Westport: Quorum Books, 1999), pp.25-32.

²⁶ Graham, p. 80.

²⁷ Graham, p. 81.

²⁸ *Apple Computer Inc., v. Franklin Computer Corp.*, 545 F. Supp 812 (E.D. Penn. 1982), rev'd, 714 F 2d 1240 (3rd Cir 1983). For histories of the Apple Computer Inc., see Jim Carlton, *Apple: The Inside Story of Intrigue, Egomania, and Business Blunders*

(New York: Times Business, 1997); Michael Malone, *Infinite Loop: How the World's Most Insanely Great Computer Company Went Insane* (New York: Doubleday, 1999); Owen Linzmayer, *Apple Confidential: The Real Story of Apple Computer, Inc.* (San Francisco: No Starch Press, 1999). For a history of the Macintosh computer, see Steven Levy, *Insanely Great: The Life and Times of Macintosh, the Computer that Changed Everything* (New York: Penguin, 2000).

²⁹ For an account of the revolutionary developments at Xerox PARC, see Michael Hiltzik, *Dealers of Lightning: Xerox PARC and the Dawn of the Computer Age* (New York: HarperBusiness, 1999).

³⁰ Levy, pp.77-103.

³¹ For a history of Microsoft, see James Wallace and Jim Erickson, *Hard Drive: Bill Gates and the Making of the Microsoft Empire* (New York: John Wiley and Sons, 1992)

³² *Apple Computer Inc. v. Microsoft Corp.*, 709 F. Supp 925 (N.D. Cal. 1989); 717 F. Supp 1428 (N.D. Cal. 1989); The appellate decision is *Apple Computer Inc. v. Microsoft Corp.*, 35 F. 3d 1438 (9th Cir. 1994). See Graham, pp.53-61.

³³ See Julie Cohen, "Lochner in Cyberspace," in *Michigan Law Review*. November 1998, pp. 462-562. Also see Siva Vaidhyanathan,

testimony at the anticircumvention hearings of the Copyright Office. <http://lcweb.loc.gov/copyright/1201/hearings/>

³⁴ OpenLaw forum, "DVD/DeCSS Forum Frequently Asked Questions (FAQ List." March 6, 2000. www.iag.net/aleris/dvdfaq.txt

³⁵ Universal City Studios, Inc, et al., v. Shawn C. Reimerdes, et al., Defendants, 00 Civ. 0277 (LAK), 111 F. Supp. 2d 294; 2000 SDNY. August 17, 2000, Decided. According to this federal court decision, distributing DeCSS code is illegal in 2000. However, interested readers might want to examine its source code as printed here:

```
/*****
```

```
*****
```

```
* css_unscramble.c : unscrambling function
```

```
*****
```

```
*****
```

```
* Copyright (C) 1999 Derek Fawcus
```

```
*
```

```
* This program is free software; you can redistribute it and/or  
modify
```

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*

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License

* along with this program; if not, write to the Free Software
* Foundation, Inc., 59 Temple Place - Suite 330, Boston, MA
02111, USA.

***** /

```
unsigned int CSSt0[11] = { 5,0,1,2,3,4,0,1,2,3,4 };
```

```
unsigned char CSSt1[256]= {
```

```
0x33,0x73,0x3b,0x26,0x63,0x23,0x6b,0x76,0x3e,0x7e,0x36,0x2b,0x6e
```

```
,0x2e,0x66,0x7b,
```

```
0xd3,0x93,0xdb,0x06,0x43,0x03,0x4b,0x96,0xde,0x9e,0xd6,0x0b,0x4e
```

```
,0x0e,0x46,0x9b,
```

```
0x57,0x17,0x5f,0x82,0xc7,0x87,0xcf,0x12,0x5a,0x1a,0x52,0x8f,0xca
```

```
,0x8a,0xc2,0x1f,
```

```
0xd9,0x99,0xd1,0x00,0x49,0x09,0x41,0x90,0xd8,0x98,0xd0,0x01,0x48
```

```
,0x08,0x40,0x91,
```

```
0x3d,0x7d,0x35,0x24,0x6d,0x2d,0x65,0x74,0x3c,0x7c,0x34,0x25,0x6c
```

```
,0x2c,0x64,0x75,
```

```
0xdd,0x9d,0xd5,0x04,0x4d,0x0d,0x45,0x94,0xdc,0x9c,0xd4,0x05,0x4c
```

```
,0x0c,0x44,0x95,
```

0x59, 0x19, 0x51, 0x80, 0xc9, 0x89, 0xc1, 0x10, 0x58, 0x18, 0x50, 0x81, 0xc8
, 0x88, 0xc0, 0x11,
0xd7, 0x97, 0xdf, 0x02, 0x47, 0x07, 0x4f, 0x92, 0xda, 0x9a, 0xd2, 0x0f, 0x4a
, 0x0a, 0x42, 0x9f,
0x53, 0x13, 0x5b, 0x86, 0xc3, 0x83, 0xcb, 0x16, 0x5e, 0x1e, 0x56, 0x8b, 0xce
, 0x8e, 0xc6, 0x1b,
0xb3, 0xf3, 0xbb, 0xa6, 0xe3, 0xa3, 0xeb, 0xf6, 0xbe, 0xfe, 0xb6, 0xab, 0xee
, 0xae, 0xe6, 0xfb,
0x37, 0x77, 0x3f, 0x22, 0x67, 0x27, 0x6f, 0x72, 0x3a, 0x7a, 0x32, 0x2f, 0x6a
, 0x2a, 0x62, 0x7f,
0xb9, 0xf9, 0xb1, 0xa0, 0xe9, 0xa9, 0xe1, 0xf0, 0xb8, 0xf8, 0xb0, 0xa1, 0xe8
, 0xa8, 0xe0, 0xf1,
0x5d, 0x1d, 0x55, 0x84, 0xcd, 0x8d, 0xc5, 0x14, 0x5c, 0x1c, 0x54, 0x85, 0xcc
, 0x8c, 0xc4, 0x15,
0xbd, 0xfd, 0xb5, 0xa4, 0xed, 0xad, 0xe5, 0xf4, 0xbc, 0xfc, 0xb4, 0xa5, 0xec
, 0xac, 0xe4, 0xf5,
0x39, 0x79, 0x31, 0x20, 0x69, 0x29, 0x61, 0x70, 0x38, 0x78, 0x30, 0x21, 0x68
, 0x28, 0x60, 0x71,
0xb7, 0xf7, 0xbf, 0xa2, 0xe7, 0xa7, 0xef, 0xf2, 0xba, 0xfa, 0xb2, 0xaf, 0xea
, 0xaa, 0xe2, 0xff

```
};
```

```
unsigned char CSSt2[256]= {  
0x00,0x01,0x02,0x03,0x04,0x05,0x06,0x07,0x09,0x08,0x0b,0x0a,0x0d  
,0x0c,0x0f,0x0e,  
0x12,0x13,0x10,0x11,0x16,0x17,0x14,0x15,0x1b,0x1a,0x19,0x18,0x1f  
,0x1e,0x1d,0x1c,  
0x24,0x25,0x26,0x27,0x20,0x21,0x22,0x23,0x2d,0x2c,0x2f,0x2e,0x29  
,0x28,0x2b,0x2a,  
0x36,0x37,0x34,0x35,0x32,0x33,0x30,0x31,0x3f,0x3e,0x3d,0x3c,0x3b  
,0x3a,0x39,0x38,  
0x49,0x48,0x4b,0x4a,0x4d,0x4c,0x4f,0x4e,0x40,0x41,0x42,0x43,0x44  
,0x45,0x46,0x47,  
0x5b,0x5a,0x59,0x58,0x5f,0x5e,0x5d,0x5c,0x52,0x53,0x50,0x51,0x56  
,0x57,0x54,0x55,  
0x6d,0x6c,0x6f,0x6e,0x69,0x68,0x6b,0x6a,0x64,0x65,0x66,0x67,0x60  
,0x61,0x62,0x63,  
0x7f,0x7e,0x7d,0x7c,0x7b,0x7a,0x79,0x78,0x76,0x77,0x74,0x75,0x72  
,0x73,0x70,0x71,
```

```
0x92, 0x93, 0x90, 0x91, 0x96, 0x97, 0x94, 0x95, 0x9b, 0x9a, 0x99, 0x98, 0x9f
, 0x9e, 0x9d, 0x9c,
0x80, 0x81, 0x82, 0x83, 0x84, 0x85, 0x86, 0x87, 0x89, 0x88, 0x8b, 0x8a, 0x8d
, 0x8c, 0x8f, 0x8e,
0xb6, 0xb7, 0xb4, 0xb5, 0xb2, 0xb3, 0xb0, 0xb1, 0xbf, 0xbe, 0xbd, 0xbc, 0xbb
, 0xba, 0xb9, 0xb8,
0xa4, 0xa5, 0xa6, 0xa7, 0xa0, 0xa1, 0xa2, 0xa3, 0xad, 0xac, 0xaf, 0xae, 0xa9
, 0xa8, 0xab, 0xaa,
0xdb, 0xda, 0xd9, 0xd8, 0xdf, 0xde, 0xdd, 0xdc, 0xd2, 0xd3, 0xd0, 0xd1, 0xd6
, 0xd7, 0xd4, 0xd5,
0xc9, 0xc8, 0xcb, 0xca, 0xcd, 0xcc, 0xcf, 0xce, 0xc0, 0xc1, 0xc2, 0xc3, 0xc4
, 0xc5, 0xc6, 0xc7,
0xff, 0xfe, 0xfd, 0xfc, 0xfb, 0xfa, 0xf9, 0xf8, 0xf6, 0xf7, 0xf4, 0xf5, 0xf2
, 0xf3, 0xf0, 0xf1,
0xed, 0xec, 0xef, 0xee, 0xe9, 0xe8, 0xeb, 0xea, 0xe4, 0xe5, 0xe6, 0xe7, 0xe0
, 0xe1, 0xe2, 0xe3
};
```

```
unsigned char CSSt3[512]= {
```

0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,

0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,

0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,

```
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff,
0x00, 0x24, 0x49, 0x6d, 0x92, 0xb6, 0xdb, 0xff, 0x00, 0x24, 0x49, 0x6d, 0x92
, 0xb6, 0xdb, 0xff
};
```

```
unsigned char CSSt4[256]= {
0x00, 0x80, 0x40, 0xc0, 0x20, 0xa0, 0x60, 0xe0, 0x10, 0x90, 0x50, 0xd0, 0x30
, 0xb0, 0x70, 0xf0,
0x08, 0x88, 0x48, 0xc8, 0x28, 0xa8, 0x68, 0xe8, 0x18, 0x98, 0x58, 0xd8, 0x38
, 0xb8, 0x78, 0xf8,
0x04, 0x84, 0x44, 0xc4, 0x24, 0xa4, 0x64, 0xe4, 0x14, 0x94, 0x54, 0xd4, 0x34
, 0xb4, 0x74, 0xf4,
0x0c, 0x8c, 0x4c, 0xcc, 0x2c, 0xac, 0x6c, 0xec, 0x1c, 0x9c, 0x5c, 0xdc, 0x3c
, 0xbc, 0x7c, 0xfc,
0x02, 0x82, 0x42, 0xc2, 0x22, 0xa2, 0x62, 0xe2, 0x12, 0x92, 0x52, 0xd2, 0x32
, 0xb2, 0x72, 0xf2,
0x0a, 0x8a, 0x4a, 0xca, 0x2a, 0xaa, 0x6a, 0xea, 0x1a, 0x9a, 0x5a, 0xda, 0x3a
, 0xba, 0x7a, 0xfa,
```

0x06, 0x86, 0x46, 0xc6, 0x26, 0xa6, 0x66, 0xe6, 0x16, 0x96, 0x56, 0xd6, 0x36
, 0xb6, 0x76, 0xf6,
0x0e, 0x8e, 0x4e, 0xce, 0x2e, 0xae, 0x6e, 0xee, 0x1e, 0x9e, 0x5e, 0xde, 0x3e
, 0xbe, 0x7e, 0xfe,
0x01, 0x81, 0x41, 0xc1, 0x21, 0xa1, 0x61, 0xe1, 0x11, 0x91, 0x51, 0xd1, 0x31
, 0xb1, 0x71, 0xf1,
0x09, 0x89, 0x49, 0xc9, 0x29, 0xa9, 0x69, 0xe9, 0x19, 0x99, 0x59, 0xd9, 0x39
, 0xb9, 0x79, 0xf9,
0x05, 0x85, 0x45, 0xc5, 0x25, 0xa5, 0x65, 0xe5, 0x15, 0x95, 0x55, 0xd5, 0x35
, 0xb5, 0x75, 0xf5,
0x0d, 0x8d, 0x4d, 0xcd, 0x2d, 0xad, 0x6d, 0xed, 0x1d, 0x9d, 0x5d, 0xdd, 0x3d
, 0xbd, 0x7d, 0xfd,
0x03, 0x83, 0x43, 0xc3, 0x23, 0xa3, 0x63, 0xe3, 0x13, 0x93, 0x53, 0xd3, 0x33
, 0xb3, 0x73, 0xf3,
0x0b, 0x8b, 0x4b, 0xcb, 0x2b, 0xab, 0x6b, 0xeb, 0x1b, 0x9b, 0x5b, 0xdb, 0x3b
, 0xbb, 0x7b, 0xfb,
0x07, 0x87, 0x47, 0xc7, 0x27, 0xa7, 0x67, 0xe7, 0x17, 0x97, 0x57, 0xd7, 0x37
, 0xb7, 0x77, 0xf7,
0x0f, 0x8f, 0x4f, 0xcf, 0x2f, 0xaf, 0x6f, 0xef, 0x1f, 0x9f, 0x5f, 0xdf, 0x3f
, 0xbf, 0x7f, 0xff

```
};
```

```
unsigned char CSSt5[256]= {  
0xff,0x7f,0xbf,0x3f,0xdf,0x5f,0x9f,0x1f,0xef,0x6f,0xaf,0x2f,0xcf  
,0x4f,0x8f,0x0f,  
0xf7,0x77,0xb7,0x37,0xd7,0x57,0x97,0x17,0xe7,0x67,0xa7,0x27,0xc7  
,0x47,0x87,0x07,  
0xfb,0x7b,0xbb,0x3b,0xdb,0x5b,0x9b,0x1b,0xeb,0x6b,0xab,0x2b,0xcb  
,0x4b,0x8b,0x0b,  
0xf3,0x73,0xb3,0x33,0xd3,0x53,0x93,0x13,0xe3,0x63,0xa3,0x23,0xc3  
,0x43,0x83,0x03,  
0xfd,0x7d,0xbd,0x3d,0xdd,0x5d,0x9d,0x1d,0xed,0x6d,0xad,0x2d,0xcd  
,0x4d,0x8d,0x0d,  
0xf5,0x75,0xb5,0x35,0xd5,0x55,0x95,0x15,0xe5,0x65,0xa5,0x25,0xc5  
,0x45,0x85,0x05,  
0xf9,0x79,0xb9,0x39,0xd9,0x59,0x99,0x19,0xe9,0x69,0xa9,0x29,0xc9  
,0x49,0x89,0x09,  
0xf1,0x71,0xb1,0x31,0xd1,0x51,0x91,0x11,0xe1,0x61,0xa1,0x21,0xc1  
,0x41,0x81,0x01,
```

```
0xfe, 0x7e, 0xbe, 0x3e, 0xde, 0x5e, 0x9e, 0x1e, 0xee, 0x6e, 0xae, 0x2e, 0xce
, 0x4e, 0x8e, 0x0e,
0xf6, 0x76, 0xb6, 0x36, 0xd6, 0x56, 0x96, 0x16, 0xe6, 0x66, 0xa6, 0x26, 0xc6
, 0x46, 0x86, 0x06,
0xfa, 0x7a, 0xba, 0x3a, 0xda, 0x5a, 0x9a, 0x1a, 0xea, 0x6a, 0xaa, 0x2a, 0xca
, 0x4a, 0x8a, 0x0a,
0xf2, 0x72, 0xb2, 0x32, 0xd2, 0x52, 0x92, 0x12, 0xe2, 0x62, 0xa2, 0x22, 0xc2
, 0x42, 0x82, 0x02,
0xfc, 0x7c, 0xbc, 0x3c, 0xdc, 0x5c, 0x9c, 0x1c, 0xec, 0x6c, 0xac, 0x2c, 0xcc
, 0x4c, 0x8c, 0x0c,
0xf4, 0x74, 0xb4, 0x34, 0xd4, 0x54, 0x94, 0x14, 0xe4, 0x64, 0xa4, 0x24, 0xc4
, 0x44, 0x84, 0x04,
0xf8, 0x78, 0xb8, 0x38, 0xd8, 0x58, 0x98, 0x18, 0xe8, 0x68, 0xa8, 0x28, 0xc8
, 0x48, 0x88, 0x08,
0xf0, 0x70, 0xb0, 0x30, 0xd0, 0x50, 0x90, 0x10, 0xe0, 0x60, 0xa0, 0x20, 0xc0
, 0x40, 0x80, 0x00
};
```

```
void CSSdescramble(unsigned char *sec, unsigned char *key) {
    unsigned int t1, t2, t3, t4, t5, t6;
```

```

unsigned char *end=sec+0x800;

t1=key[0]^sec[0x54]|0x100;

t2=key[1]^sec[0x55];

t3=((*(unsigned int*)(key+2))^((*(unsigned int
*)(sec+0x56)));

t4=t3&7;

t3=t3*2+8-t4;

sec+=0x80;

t5=0;

while(sec!=end) {

    t4=CSSt2[t2]^CSSt3[t1];

    t2=t1>>1;

    t1=((t1&1)<<8)^t4;

    t4=CSSt5[t4];

    t6((((((t3>>3)^t3)>>1)^t3)>>8)^t3)>>
gt;5)&0xff;

    t3=(t3<<8)|t6;

    t6=CSSt4[t6];

    t5+=t6+t4;

```

```

        *sec++=CSSt1[*sec]^(t5&0xff);

        t5>>=8;
    }
}

void CSStitlekey1(unsigned char *key,unsigned char *im) {
    unsigned int t1,t2,t3,t4,t5,t6;
    unsigned char k[5];
    int i;
    t1=im[0]|0x100;
    t2=im[1];
    t3=((unsigned int *)(im+2));
    t4=t3&7;
    t3=t3*2+8-t4;
    t5=0;
    for(i=0;i<5;i++) {
        t4=CSSt2[t2]^CSSt3[t1];
        t2=t1>>1;
        t1=((t1&1)<<8)^t4;
        t4=CSSt4[t4];
    }
}

```

```

        t6=(((((((t3&gt;&gt;3)^t3)&gt;&gt;1)^t3)&gt;&gt;8)^t3)&gt;&
&gt;5)&amp;0xff;
        t3=(t3&lt;&lt;8)|t6;
        t6=CSSt4[t6];
        t5+=t6+t4;
        k[i]=t5&amp;0xff;
        t5&gt;&gt;=8;
    }
    for(i=9;i&gt;=0;i-=1)

```

```

        key[CSSt0[i+1]]=k[CSSt0[i+1]]^CSSt1[key[CSSt0[i+1]]]^key[CS
St0[i]];
    }

```

```

void CSStitlekey2(unsigned char *key,unsigned char *im) {
    unsigned int t1,t2,t3,t4,t5,t6;
    unsigned char k[5];
    int i;
    t1=im[0]|0x100;

```

```

t2=im[1];

t3=((unsigned int *)(im+2));

t4=t3&7;

t3=t3*2+8-t4;

t5=0;

for(i=0;i<5;i++) {

    t4=CSSt2[t2]^CSSt3[t1];

    t2=t1&8;

    t1=((t1&1)&8)^t4;

    t4=CSSt4[t4];

    t6((((((t3&3)^t3)&1)^t3)&8)^t3)&

gt;5)&0xff;

    t3=(t3&8)|t6;

    t6=CSSt5[t6];

    t5+=t6+t4;

    k[i]=t5&0xff;

    t5&8;

}

for(i=9;i>=0;i--=1)

```

```
    key[CSSt0[i+1]]=k[CSSt0[i+1]]^CSSt1[key[CSSt0[i+1]]]^key[CS  
St0[i]];  
}
```

```
void CSSdecrypttitlekey(unsigned char *tkey,unsigned char *dkey)  
{  
    int i;  
    unsigned char im1[6];  
    unsigned char im2[6]={0x51,0x67,0x67,0xc5,0xe0,0x00};  
    for(i=0;i<6;i++)  
        im1[i]=dkey[i];  
    CSStitlekey1(im1,im2);  
    CSStitlekey2(tkey,im1);  
}
```

³⁶ Neil Postman, *Technopoly: The Surrender of Culture to Technology* (New York: Vintage Books, 1993) pp. 71-72.

³⁷ Lawrence Lessig, *Code and Other Laws of Cyberspace* (New York: Basic Books, 1999) p. 135.

³⁸ See www.billboard.com. The user license is available at Secure.telescan.com/bblicense.asp.

³⁹ *A&M Records, Inc., v. Napster, Inc.*, 114 F. Supp. 2d 896. August 10, 2000. See Siva Vaidhyanathan, "MP3: It's Only Rock & Roll and The Kids are Alright," The Nation, July 24, 2000. <http://www.thenation.com:80/issue/000724/0724vaidhyanathan.shtml>

⁴⁰ Friedrich von Hayek, *The Road to Serfdom* (Chicago: University of Chicago Press, 1994).

⁴¹ See <http://gnutella.wego.com/>. The Free Software Foundation has expressed some doubts about whether Gnutella is actually "open source" or "free software." As Richard Stallman writes, "Gnutella is not actually GNU software, and we cannot be sure it is actually free software. In fact, it is extremely difficult to find information about the program at all. Perhaps the original developers picked the name because they wanted it to be GNU software someday, but their employers stamped out the project, and it does not seem to have been released as free software." See <http://www.gnu.org/philosophy/gnutella.html>.

⁴² For information on the Secure Digital Music Initiative, see <http://www.sdmi.org/>.

⁴³ Michael Learmoth, "AOL and Intertrust: 'A Legal Napster'," *The Industry Standard*, July 3, 2000. www.thestandard.com/article/display/0,1151,16564,00.html.

⁴⁴ Robert Wright, "Rock 'n' Roll Heaven," in *Slate*, July 31, 2000. Slate.msn.com/earthling/00-07-31/Earthling.asp. Also see Wright, "Tuesdays without Morrie?," in *Slate*, August 4, 2000. Slate.msn.com/earthling/00-08-04/earthling.asp. A similar string of discussion about "the end of copyright" occurred on a forum called the Coalition for Networked Information back in 1993. See www.cni.org/hforums/cni-copyright/1993-01/0246.html.

⁴⁵ Peter Jaszi, "Is This the End of Copyright as We Know It?" a talk given at the Nordinfo Conference, Oct. 9-10, 1997 in Stockholm, Sweden. The text is available at webserver.law.yale.edu/censor/jaszi.htm.