EMULATING THE CLASSIC VIDEO GAMES
Protecting Copyright on the Internet

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INTRODUCTION

Arguably one of the most important new technologies of the Twentieth Century, the Internet[1] has exploded in popularity since its inception in 1969.[2] There is no single entity controlling the Internet.[3] It also has no central storage location, control point, or communication channel.[4] Two hundred million people are estimated to use the Internet.[5] These users can connect to the Internet by using a computer "that is directly . . . connected to a computer network that is itself directly or indirectly connected to the Internet."[6] The more common method, however, is to access the Internet with a personal computer through an Internet Service Provider (ISP)[7] and a modem.[8]

Once connected to the Internet, a person can utilize the World Wide Web (WWW) for a variety of purposes.[9] For example, it allows the user to make a telephone call, watch a

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[1] The Internet had its origins in 1969 as an experimental project of the Advanced Research Project Agency. American Civil Liberties Union v. Reno, 929 F. Supp. 824, 831 (E.D. Penn. 1996) (findings of fact) [hereinafter *ACLU*]. The network linked computers and networks owned by the military, defense contractors, and university laboratories conducting defense related research. *Id*.
[2] *Id*.
[3] *Id*.
[4] *Id.* at 831.
[5] *Id*.
[6] *Id.* at 832.
[7] Internet Service Providers are usually commercial networks such as America Online and Compuserve.
[8] *See ACLU*, 929 F. Supp. at 832.
[9] *Id.* at 832-33.

video, listen or make an audio broadcast, shop, learn, and communicate with anyone else connected to the Internet.[10] Originally developed at the European Particle Physics Laboratory, the WWW was created to serve as a platform for a global online library that contained information from a diversity of sources and was accessible to users around the world.[11] Global access is achieved through the utilization of web pages; documents designed to represent organizations or individuals containing information relevant to the organization or individual.[12] The pages convey this information through text, still images, sounds, video, and downloadable software.[13] Pages are "linked" to other pages through hyperlinks.[14]

A popular pastime for Internet users is "gaming," which is accomplished in a variety of ways. The earliest method involved a "choose your own adventure" format.[15] The user would read text and then click on a link depending on his or her choice of action.[16] The game would continue until the player won or made a wrong choice, where the referenced page ended the game.[17] As technology advanced, so did the online games. For example, the Java system allowed computers with different operating systems to communicate with each other.[18] With Java, players using different types of computers could compete against each other in real time over the Internet.[19] Finally, people were able to download game software

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[10] Christopher Anderson, *The Accidental Superhighway*, ECONOMIST, July 1, 1995, at 5, *available in* 1995 WL 9569618.
[11] *ACLU*, 929 F. Supp. at 836.
[12] *Id*.
[13] *Id*.
[14] *Id*. Links are typically short sections of text or an image that refers to another document in the WWW. Usually the text is blue or underlined when displayed. The user clicks on the link with his/her mouse and the referenced document is automatically displayed.
[15] *Hunt the Wumpus* (visited Apr. 14, 2000) <http://scv.bu.edu/htbin/wcl>.
[16] *Welcome to Web Wumpus* (visited Apr. 14, 2000) <http://scv.bu.edu/Games/wumpus.html>.
[17] *Id*.
[18] *See Yahoo! Games* (visited Nov. 10, 1999) <http://games.yahoo.com>.
[19] *See id*.

from the Internet for use on their computers.[20] However, some of the software is placed on web sites without the permission of the author.[21] This triggers copyright concerns for the authors of the software. In the middle of the copyright controversy are emulator programs and their games.

I. EMULATORS

The computer chips that ran the "amazing" video games of the later seventies and eighties use only a fraction of the power in today's normal personal home computer.[22] Today's computers are so superior, in fact, that it is possible to run programs that imitate their operating systems.[23] This is not a new phenomenon, however. Computer hackers have been writing programs to simulate their favorite games since the first Apple II personal computer was released in the early eighties.[24] The simulated games were similar to the originals but not exact copies.[25] That is a fundamental difference between the emulators of today and the game programs of the past. Emulation is the process of making the original game's Read Only Memory (ROM) code execute on a personal computer (PC) through software translation of the original central processing unit (CPU) instructions.[26] Emulated games are not rewritten for the processor but actually run as they were meant to run by emulating the processors and supporting chips themselves.[27]

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[20] *CNET.com – Downloads – Mac* (visited Apr. 14, 2000) <http://download.cnet.com>. This site allows Apple Macintosh or PowerPC users to download different types of software, such as games, multimedia design, and development tools. *Id.*

[21] John H. Moran, *Going 'Berzerk' Software Emulating Classic Video Games Descends Like 'Space Invaders' from Web Site*, HARTFORD COURANT, Apr. 2, 1998, at F1, *available in* 1998 WL 2348453.

[22] *Computer Emulation: The Sincerest Form of Flattery*, ECONOMIST, Mar. 13, 1999, at 96, *available in* 1999 WL 7362080.

[23] *Id.*

[24] Moran, *supra* note 21.

[25] *Id.*

[26] Roger Bonine, *Classic Arcade Emulation Frequently Asked Questions* (last modified Nov. 1, 1997) <http://rbonine.home.mindspring.com/aeca-FAQ/faq.txt>.

[27] *Id.*

Italian mathematics students, Nicola Salmoria and Mirko Buffoni, developed the dominant program used to play the classic coin-operated video games in 1997 for the DOS operating system.[28] The Multiple Arcade Machine Emulator (MAME) is used in conjunction with the games or ROMs, so called because the game programming was originally stored in Read Only Memory.[29] The games are genuine down to the requirement of inserting a coin, simulated by pressing the button "3".[30] Most of the ROMs came from people who bought the old arcade machines at junk sales and downloaded the games' software from the machine's memory chips.[31] There are nearly 500 arcade games that can be downloaded from the Internet.[32] The companies holding the copyrights for these ancient games did not care about the infringing activity until the larger video game companies, such as Nintendo and Sega, became involved because they did not believe that there was still a market for the games, and therefore were not losing money.[33]

Today, the video game companies are able to crack down on the emulator sites due to the presence of the ROMs. These games are derivative works[34] under the holding of *Midway Manufacturing Co. v. Artic International, Inc.*[35] *Midway* was one of the original cases that

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[28] Jeffrey Adam Young, *Missing 'Ms. Pac Man'? Download Arcade Emulator, and 'Nwaka-Nwaka' Down Memory Lane*, PORTLAND OREGONIAN, Apr. 20, 1998, at 2, *available in* 1998 WL 4199761.
[29] Moran, *supra* note 21.
[30] *Id*.
[31] *Game Over?*, NEW SCIENTIST, Jan. 16, 1999 (visited Nov. 10, 1999) <http://www.newscientist.com/ns/19990116/newstory11.html>.
[32] Michael Stroh, *Digital Archaeologists Hope to Restore Classic Games*, KNIGHT-RIDDER TRIB. BUS. NEWS, Apr. 29, 1998, *available in* 1998 WL 14012297.
[33] *Id*.
[34] A "derivative work" is defined as

> one or more preexisting works, such as a translation, musical arrangement, dramatization, fictionalization, motion picture version, sound recording, art reproduction, abridgment, condensation, or any other form in which as work may be recast, transformed, or adapted. A work consisting of editorial revisions, annotations, elaborations, or other modifications which, as a whole, represent an original work of authorship, is a 'derivative work.'

Copyright Act of 1976, 17 U.S.C. § 101 (1995).
[35] 704 F.2d 1009 (7th Cir. 1983).

granted video games copyright protection under the Copyright Act of 1976.[36] Midway, the plaintiff, was one of the original video game manufacturers.[37] The defendant, Artic, sold circuit boards that altered the play of the game Galaxian, and simulated the play and sound of the game Pac-Man.[38] Midway sued alleging copyright infringement and claiming that the games were protected under section 101 of the Copyright Act defining audiovisual works.[39]

The court raised two issues that had to be overcome in order to fit video games into the audiovisual works definition.[40] First, the phrase, "series of related images," is ambiguous and could be interpreted to either include or exclude video games based on how broadly the language was read.[41] The court gave the statutory language a liberal meaning, reasoning that "Congress probably wanted the courts to interpret the definitional provisions of the new act flexibly, so that it would cover new technologies as they appeared, rather than to interpret those provisions narrowly and so force Congress to periodically act."[42] Second, the court decided "whether the creative effort in playing a video game was enough like writing or painting to make each performance of a video game the work of the player and not the game's inventor."[43] It reasoned that the creative effort laid in the inventor and not the player because "the player of the video game does not have control . . . the most he can do is choose one of the limited number of sequences the game allows him to choose."[44]

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[36] *Id.* at 1012.
[37] *Id.* at 1010.
[38] *Id.*
[39] *Id.* at 1011.

> Audiovisual works are works that consist of a series of related images which are intrinsically intended to be shown by the use of machines or devices such as projectors, viewers, or electronic equipment, together with accompanying sounds, if any, regardless of the nature of the material objects, such as films or tapes, in which the works are embodied.

17 U.S.C. § 101.
[40] *Midway*, 704 F.2d at 1011.
[41] *Id.*
[42] *Id.*
[43] *Id.*
[44] *Id.* at 1012.

The defendant's most powerful argument was that increasing the speed of play on the video game was not infringement.[45] Rather, it was analogous to playing a record at a higher speed.[46] The court was not swayed by this argument. Instead, the court held that the circuit board that increased the speed of the game was a derivative work under the Copyright Act.[47] The increase in difficulty of game play that accompanied more speed created a different game that had more value.[48] This theory, then, should give the copyright owner the same rights with respect to the derivative work as the original.

Midway is important for two reasons. First, video games were granted copyright protection for the first time. Second, video games were classified as derivative works. Computer programs are easily manipulated by other programmers and by classifying them as derivative works, the original developer has protection against a minor change in the program.

However, *Midway* does not stop software programmers from utilizing their skill to use the classic stand-up video game software to make new platforms for playing the game. There are a wide variety of emulators on the WWW available for download that have gone beyond just the stand-up, coin-operated games of the past.[49] "Pete's Computer & Video Game Emulator Page" allows the user to link to ten different emulators or emulator web pages.[50] Although this may seem like a large number, the web page only services Apple Macintosh computers.[51] Another site, "Dave's Classics" had emulators and ROMs for PCs.[52]

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[45] *Id*.
[46] *Id.* at 1013.
[47] *Id*.
[48] *Id*.
[49] *Pete's Computer & Video Game Emulator Page* (last modified Feb. 3, 2000) <http://www.y2krunch.com/petebuilt/videogames/emulate.html>.
[50] *Id*. The site includes Arcade, Atari 2600, Atari 5200, Colecovision, GameBoy, Super Nintendo, Vectrex, Sega MasterGear, Apple II, and Atari 400/800. *Id*.
[51] *Id*.

The site was forced to remove over a thousand classic games due to copyright problems in 1999.[53] The creator of the site had not obtained permission from the copyright owners to post the games on his web page.[54] Sony Corporation finally shut down the site after it had illegal posted some of the company's proprietary information.[55] Currently, the page contains a letter of apology to Sony for the illegal posting.[56]

Because technological advances continue to evolve, courts have a hard time keeping up with the changes and have not been able to create a clear test of what constitutes copyright infringement for computer copies once they get past the initial inquiry applied to all forms of media. The standard for copyright infringement was enunciated in *Feist Publications, Inc. v. Rural Telephone Service Co.*[57] The Supreme Court used a two-prong test to determine if the copyright was infringed: "(1) ownership of a valid copyright, and (2) copying of constituent elements of the work that are original."[58] Normally, the courts have a hard time determining copying in computer software cases because the analysis involves the underlying binary code that instructs the computer how to act.

Works can enter the public domain in two ways. First, copyright protection for works created after January 1, 1978,[59] lasts until seventy years after the death of the author.[60] Since all of the computer chip intensive games were written after this date, the previous copyright acts are inapplicable in this situation. Second, copyright protection may be terminated

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[52] Richard Longhurst, *Connected: Real World: Bored Kids? Never Fear Your PC Is Here: Your Only A Couple Of Weeks Into Summer Holidays And Already The Kids Are Bored*, DAILY TELEGRAPH (LONDON), Aug. 12, 1999, *available in* 1999 WL 23223523.
[53] *Game Over?*, *supra* note 31.
[54] *Id*.
[55] Jack Schofield, *Gameswatch*, GUARDIAN (LONDON), Apr. 15. 1999, *available in* 1999 WL 16875545.
[56] *Final Text of Apology* (visited Apr. 14, 2000) <html://www.davesclassics.com>.
[57] 499 U.S. 340 (1991).
[58] *Id.* at 361.
[59] Video games are a relatively new phenomenon and very few were created before this date.

through the express intention of the author.[61] When a work enters the public domain, it may be copied without any fear of infringement. Also, once a work enters the public domain, it cannot obtain copyright protection.

A. Copyright of ROMs

Even though web page creators acknowledge the possible copyright issues that arise out of the ROMs, they feel that they are being unfairly targeted.[62] Patrick Lawrence, a 28-year old computer programmer claims that, "[t]he games are going to decay away if they aren't archived."[63] Fans of classic games, like the programmers, also argue that emulation is helping to preserve video arcade games, many of which would be approaching extinction if not for the effort of the fans.[64] The preservation argument, however, must ultimately fail. Only copyright holders can determine whether they want their software to be archived.[65] Even though the intentions of the programmers seem innocent, disseminating games over the Internet violates the copyright holder's exclusive rights. The Copyright Act provides strict

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[60] "Copyright in a work created on or after January 1, 1978, subsists from its creation and, except as provided by the following subsections, endures for a term consisting of the life of the author and seventy years after the author's death." 17 U.S.C. § 302(a) (1995 & Supp. 2000).

[61] Brad Templeton, *10 Big Myths about Copyright Explained* (visited Nov. 10, 1999) <http://www.templetons.com/brad/copymyths.html>.

[62] Stroh, *supra* note 32.

[63] *Id*.

[64] Moran, *supra* note 21.

[65]
> Subject to section 107 through 120, the owner of a copyright under [the Copyright Act] has the exclusive rights to do and to authorize any of the following:
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> (1) to reproduce the copyrighted work in copies or phonorecords;
> (2) to prepare derivative works based upon the copyrighted work;
> (3) to distribute copies or phonorecords of the copyrighted works to the public by sale or other transfer of ownership, or by rental, lease or lending;
> (4) in the case of literary, musical dramatic, and choreographic works, pantomimes, and motion pictures and other audiovisual works, to perform the copyrighted works publicly;
> (5) in the case of literary, musical, dramatic, and choreographic works, pantomimes, and other audiovisual work, to display the copyrighted work publicly; and
> (6) in the case of sound recordings, to perform the copyrighted work publicly by means of a digital audio transmission.

17 U.S.C. § 106 (1995).

requirements for copies made by archives.[66] First, only employees "acting within the scope of their employment" can make a single copy.[67] The web sites containing the ROMs are not official libraries or archives. Therefore, web sites can not make copies under this section. Next, the statute prohibits an employee from engaging "in the systematic reproduction or distribution of single or multiple copies . . . ."[68] The ability to download a copy of the games from the web site is in direct violation of section 108. Based on the statutory language of the Copyright Act, the programmers' preservation argument cannot succeed.

Another argument suggested by the programmers involves the financial side of reviving classic games. Since the emulators and ROMs are being disseminated free of charge, programmers feel that the large companies will not bring suit against them.[69] This argument is usually coupled with the common misconception that copyright holders are not losing money since many of the companies that invented the games no longer exist.[70] As Shane Monroe, the creator of the Insert Coin games site, realizes, "the companies didn't care about [classic game emulators] until we made a market for [them]."[71] Before realizing that a market for classic games existed, Activision Executive Vice-President, Howard Marks, said that there was not enough demand to re-release most old games.[72] Contrary to his earlier opinion, Activision has released a CD-ROM of their vintage games such as Pac-Man and Tempest.[73] One of the first personal computers, Commodore 64, is also reentering the

[66] 17 U.S.C. § 108 (1995).
[67] 17 U.S.C. § 108(a).
[68] 17 U.S.C. § 108(g)(1).
[69] John Alderman, *Saving Pac-Man for Posterity*, WIRED NEWS (visited Nov. 10, 1999) <http://www.wired.com/news/culture/story14046.html>.
[70] Moran, *supra* note 21.
[71] *Game Over?*, *supra* note 31.
[72] Alderman, *supra* note 69.
[73] Stroh, *supra* note 32.

market.[74] Web Computers International of the Dutch Antilles has developed a machine that will allow its user to hook up the Internet, word process, and run old Commodore 64 games.[75]

Even the copyrights of games produced by companies no longer existing retain their value. Hasbro Interactive purchased the rights to all 75 titles contained in the now defunct Atari library.[76] The problem with the programmers' argument is that the copyrights for classic games have no value and it is based on the mistaken assumption that a company can lose their copyright protection through inactivity. This is not the case. As was discussed earlier, the only way a copyright holder can forfeit copyright protection before the statutory period expires is through the direct intent of the author. This has only happened in a few isolated incidents. For example, in order to promote a newer version of the Ultima game series, the company allowed the earlier version, Ultima IV, to be downloaded from its web site.[77]

The programmers also claim two additional defenses against copyright liability. Many sites place a warning invoking section 117 of the Copyright Act[78] saying that only

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[74] Richard Des Ruisseaux, *Commodore 64 Rides Again, What's New in Technology*, EDMONTON SUN, Sept. 3, 1998, at 56, *available in* 1998 WL 18105391.

[75] *Id.*

[76] David Kushner, *Past Blasters: The '80s Arcade Classics Are Back, Either in Newfangled Versions or in Their Gritty Pixels-and-All Glory*, ENTERTAINMENT WEEKLY, May 22, 1998, at 76, *available in* 1998 WL 8038462. So far the company has only released modern versions of the classic Atari 2600 games.

[77] Edward Franks, *Ultima IV Download* (last modified Apr. 11, 1999) <http://home.earthlink.net/~fortran/u4.html>.

[78]
> (a) . . . it is not an infringement for the owner of a copy of a computer program to make or authorize the making of another copy or adaptation of that computer program provided:
>
> > (1) that such a new copy or adaptation is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner, or
> >
> > (2) that such new copy or adaptation is for archival purposes only and that all archival copies are in the event that continued possession of the computer program should cease to be rightful.
>
> (b) . . . Any exact copies prepared in accordance with the provisions of this section may be leased, sold, or otherwise transferred, along with the copy from which such copies were prepared, only as part of the lease, sale or other transfer of all rights in the program.

users who own the software or game in question may legally download a copy of the game.[79] The courts have yet to rule on the meaning of section 117. Without an interpretation by the courts, both copyright holders and programmers can construe section 117 in their defense. The copyright holders could argue that section 117(b) prohibits a downloaded copy of a game since the section requires that exact copies of a copy of a computer program must be transferred with the original copy and the transfer can only occur with the copyright holder's permission.[80] On the other hand, the programmers could argue that section 117(a) applies to downloaded copies of the games. Section 117(a) states that owners of a copy of a computer program can "authorize" another to make the copy.[81] Therefore, the programmers posting ROMs on the Internet could argue that the ability to download the game implies authorization. Also, they could argue that the copyright holder's permission is not needed because section 117(b) only prohibits transfers of copies to persons who do not own the game.[82] In order to avoid the provisions of section 117(b), the sites require that the downloader already have a copy of the game.

Of course, the web page developers cannot and do not monitor the downloads, so they have no way of knowing whether the person has a copy of the game. For this reason, web sites added a disclaimer stating that visitors to the web sites can download the games at their own risk.[83] Another possible way for web page developers to avoid legal consequences may be to claim that certain uses, i.e., downloading a game and testing if for twenty-four hours

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> Adaptations so prepared may be transferred only with the authorization of the copyright owner."

17 U.S.C. § 117 (1995).

[79] *Gamezone: The MAME of the Game Garrett Rowe Dreams Into the Past and Future*, IRISH TIMES, Nov. 23, 1998, at 12, *available in* 1998 WL 13633974.

[80] 17 U.S.C. § 117(b).

[81] *Id.* § 117(a).

[82] *Id.* § 117(b).

before erasing it from the hard drive, is a "fair-use."[84] The Supreme Court discussed the issue of fair use in *Harper & Row, Publishers, Inc. v. Nation Enterprises*.[85] The case involved President Gerald R. Ford's autobiography.[86] The piece was supposed to be published in Time Magazine as dictated in an agreement with the publisher.[87] The Court set out a four part test to determine if a use is protected as a fair use that has since been codified in section 107 of the Copyright Act: "(1) the purpose and character of the use; (2) the nature of the copyrighted work; (3) the substantiality of the portion used in relation to the copyrighted work as a whole; and (4) the effect on the potential market for or value of the copyrighted work."[88] The Court ultimately found no fair use in this case.[89]

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[83] *Vintage Gaming Network – Disclaimer* (visited June 6, 2000) <http://www.vintagegaming.com/disclaimer.html>.

[84]
> [T]he fair use of a copyrighted work, including such use by reproduction in copies or phonorecords or by any other means specified by that section, for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright. In determining whether the use made of a work in any particular case is a fair use the factors to be considered shall include –
>> (1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;
>> (2) the nature of the copyrighted work;
>> (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and
>> (4) the effect of the use upon the potential market for or value of the copyrighted work.
>
> The fact that a work is unpublished shall not itself bar a finding of fair use if such finding is made upon consideration of all the above factors.

17 U.S.C. § 107 (1995).

[85] 471 U.S. 539 (1985).

[86] *Id.* at 542.

[87] *Id*.

[88] *Id.* at 560-61.

[89] The Court looked at each factor separately. They found that the first factor favored Harper because the conduct by Nation was both commercial and lacked good faith. *Id.* at 561-63. The second factor also helped Harper as the Court decided that the Nation excerpted not only the factual portions of the work, but also the subjective expression used by the author. *Id.* at 563-64. The third factor also weighed against fair use because the Nation took the sections verbatim from the manuscript. *Id.* at 564-66. Finally, the Court found the fact that Time cancelled their agreement with Harper because of the Nation's act. *Id.* at 567. This was an effect on the market that went against finding fair use. *Id.* at 567-68.

The Ninth Circuit tackled this issue in relation to video games in *Lewis Galoob Toys, Inc. v. Nintendo of America*.[90] Nintendo marketed a home arcade system.[91] Galoob manufactured a device that allowed the player to change up to three features of a Nintendo game, i.e. speed, number of lives available, and invincibility.[92] The device, known as the Game Genie, functioned by blocking the value for a single data byte and replacing it with a new value.[93] The effects only lasted as long as the game cartridge was in the console and the machine remained on.[94]

Nintendo argued that the new audiovisual displays created by the Game Genie constituted derivative works as defined under the Copyright Act.[95] Unlike the Seventh Circuit in *Midway*, the court did not find that the changes in the game were enough to establish a derivative work.[96] The Game Genie does not itself "produce an audiovisual display; the underlying display must be produced by a Nintendo Entertainment System and game cartridge."[97] The court distinguishes *Midway* because the chip marketed by Artic substantially copied and replaced the chip used by Midway.[98] Also, unlike *Midway*, the Game Genie does not adversely affect the demand for the Nintendo console or its games because it can only enhance the playing experience.[99]

The court next discusses the doctrine of fair use, which allows "a holder of the privilege to use the copyrighted material in a reasonable manner without the consent of the

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[90] Nintendo of America v. Lewis Galoob Toys, Inc., 964 F.2d 965 (9th Cir. 1992). (Both parties had cross-claims against each other so the case may also be cited as – Lewis Galoob Toys, Inc. v. Nintendo of America, 964 F.2d 965 (9th Cir. 1992).
[91] *Id.* at 967.
[92] *Id.*
[93] *Id.*
[94] *Id.*
[95] *Id.* at 968.
[96] *Id.*
[97] *Id.*
[98] *Id.* at 969.
[99] *Id.*

copyright owner."[100] For this discussion, the court assumed that the changes created by the Game Genie were derivative works and it focused on the consumers who purchased and used the Game Genie.[101] The court's assumption that the Game Genie was a derivative work made it more difficult for Nintendo to prove that fair use was not present in its situation. The court used the factors laid out in *Nation* to decide if the use fell into the fair use doctrine.[102] Under the first factor, the court determined that the private home enjoyment of a Game Genie was a noncommercial and nonprofit activity.[103] Based on the second factor, the court found that derivative works are presumptively fair.[104] The court determined that the third factor favored Nintendo, but was not enough to overcome the presumption of fair use.[105] Finally, the court found that the Game Genie had no effect upon the potential market for Nintendo's game cartridges.[106] In order to use the Game Genie, the consumer must already have purchased the game from Nintendo.[107] Nintendo did attempt to make the argument that the test for the fourth factor should cover the market for derivative works rather than the market harm of the game cartridges.[108] Although this is a valid argument, the court was not swayed by the facts because "(1) Nintendo has not, to date, issued or considered issuing altered versions of existing games, and (2) Nintendo has failed to show the reasonable likelihood of such a market."[109] This market cannot be presumed. The most persuasive argument Nintendo had against the fair use was the creative nature of video games because fair use is

[100] *Id.* (quoting Narell v. Freeman, 872 F.2d 907, 913 (9th Cir. 1989)).
[101] *Id.* at 970.
[102] *See Nation*, 471 U.S. at 560-61.
[103] *Nintendo*, 964 F.2d at 970.
[104] *Id.*
[105] *Id.* at 971.
[106] *Id.*
[107] *Id.*
[108] *Id.*
[109] *Id.*

more likely to be found in factual works rather than fictional ones.[110] Factual works have less protection because it is in society's best interest to have factual knowledge disseminated to the general public and the courts do not want to affect the availability of facts from the general public. It is not persuasive alone and does not outweigh the evidence for finding fair use.[111]

The court in *Nintendo* held that Galoob did not violate the Copyright Act and therefore, Nintendo was not entitled to an injunction.[112] The court's reasoning in *Nintendo* helps with the analysis of the legality of emulators and ROMs. Under the first factor of fair use,[113] ROMs probably would be a fair use. The use is not commercial and most programmers are probably operating under the innocent assumption that they were saving classic games for future users. The second and third prongs[114] of the analysis, however, would be against a fair use. The games are not factual and contain their author's expression. It is not possible to separate the expression from the functional language in the game code. Also, the entire game is copied, which is a substantial use of the original. Finally, the fourth and most important factor[115] would not favor fair use. There is a definite effect on the market for games, especially by the newer ROMs. People will download the games for free instead of buying them from the companies who own the copyrights for the games.

The problem of unauthorized ROMs on the Internet has become so large that a United States Trade Association, the Interactive Digital Software Association (IDSA), has been formed to find and shut down violating web sites.[116] It is a private company funded by the

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[110] *Id.* at 972.
[111] *Id.*
[112] *Id.*
[113] 17 U.S.C. § 107(1).
[114] *Id.* § 107(2) and (3).
[115] *Id.* § 107(4).
[116] IDSA, *Anti-Piracy Information* (visited Nov. 10 , 1999) <http://www.idsa.com/piracy.html>.

membership dues of participating companies.[117] The IDSA has been authorized by its members to act on their behalf when illegal software has been found.[118] To combat this illegal activity on the Internet, the IDSA's efforts include "direct investigation and enforcement actions domestically, internationally and in the online environment, working closely with government agencies such as United States Trade Representative, the United States Customs Service, the Federal Bureau of Investigation (FBI), and foreign government officials and training and educating customs agents & law enforcement officers in the United States and around the world."[119]

ROMs probably do violate the protection afforded by the Copyright Act and the defenses used by the programmers do not effectively bypass this protection. The video game companies, however, are targeting more than just programmers of ROMs; the actual emulating software has also come under fire.

B. Copyright of Emulators

The battle against emulator web sites by the video game companies went into full scale because the programs being offered on the web sites allowed users to play new titles for consoles sold by leading developers like Sega, Sony, and Nintendo.[120] The two emulators that have caused the greatest splash are the Virtual Game Station, which allows users to play Sony's Playstation games, and the UltraHLE, which runs Nintendo 64 titles.[121] Nintendo has threatened legal action against the web sites distributing UltraHLE and it has been removed from many of these web sites.[122] One web site programmer is attempting to use another

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[117] *Id.*
[118] *Id.*
[119] IDSA, *IDSA's Frequently Asked Questions* (visited Feb. 16, 1999) <http://www.idsa.com/about/faq.htm>.
[120] Matt Hines, *Game Emulators Facing Issues of Legality*, NEWSBYTE, Feb. 12, 1999, *available in* 1999 WL 5119080.
[121] *Id.*
[122] *Id.*

method to circumvent the Nintendo legal team. Known only as the GossiTheDog, he has posted a near-complete version of UltraHLE that the downloader must be able to complete in order for it to be utilized.[123]

The Virtual Game System poses a different problem for Sony, which has already filed suit against Connectix Corporation, creator of the program.[124] Unlike many emulators, the system does not use pirated games from the Internet.[125] It was created for the Apple Macintosh G3 computer to compete with Sony.[126] The computer owners must use actual Playstation games in their CD-ROM drives.[127] Roy McDonald, president and chief executive officer of Connectix, defends his product because "Virtual Game Station gives Macintosh owners more games to chose from and Playstation owners more choice in where they play their games and we will continue to fight for the customers' right to choice."[128] Because of the Virtual Game Station, Sony brought suit against Connectix.[129] The case reached the United States Court of Appeals on September 14, 1999.[130] Sony argued that Connectix violated their copyright protections.[131] The Virtual Game Station, itself, does not contain any of Sony's propriety information.[132] Instead, Sony asserts that Connectix violated their Copyright protection because they repeatedly copied Sony's basic input-output system (BIOS) during the process of "reverse engineering" that Connectix conducted in order to find out how the Sony Playstation worked.[133] Copyrighted Software contains both the protected

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[123] *Id.*
[124] *Id.*
[125] *Id.*
[126] *Id.*
[127] *Id.*
[128] *Id.*
[129] Sony Computer Entertainment, Inc. v. Connectix Corp., 48 F. Supp. 2d 1212 (N.D. Cal. 1999).
[130] *See* Sony Computer Entertainment, Inc. v. Connectix Corp., 203 F.3d 596 (9th Cir. 1999).
[131] *Id.* at 598-99.
[132] *Id.* at 598.
[133] *Id.*

material and functional elements that can not be copyrighted.[134] In order to gain access to the functional portions of a program, designers developing a compatible product to the copyrighted software must use a process called "reverse engineering."[135] There are four methods that can be utilized in reverse engineering: reading about the program, observing the program in operation by using it on a computer, performing a static examination of the individual computer instructions as the program is being run on a computer, and performing a dynamic examination of the individual computer instructions as the program is being run on a computer.[136] The first and least effective method could not be used by the engineers at Connectix because Sony does not release such information about its Playstation.[137] The remaining methods require the user to load the program onto a computer, which copies the protected material into the computer's random access memory[138] or RAM every time the user turns on or reboots the machine.[139] Observation of the software can take many forms.[140] The engineers can observe the program's visuals on a computer screen or run the program in an emulated environment to observe the signals sent between the BIOS and other programs on the computer.[141] The latter observation required the Connectix engineers to copy the BIOS from the Sony chip onto a computer.[142] The final two methods require the engineers to use a program known as a "disassembler" to translate the ones and zeros of binary machine-readable code into the words and mathematical symbols of the source code.[143] These

[134] *Id*. at 599.
[135] *Id.*
[136] *Id.*
[137] *Id.* at 600.
[138] The Copyright Act provides in 17 U.S.C. § 117(a)(1), that it shall not be infringement for one who owns a software copy to make another copy "created as an essential step in the utilization of the computer program in conjunction with another machine and that it is used in no other manner." 17 U.S.C. § 117(a)(1).
[139] *Id.*
[140] *Id.*
[141] *Id.*
[142] *Id.*
[143] *Id.*

methods require that the program be copied into RAM and the disassembler program.[144] The Connectix engineers observed the Playstation BIOS through debugger programs in an emulated environment and also copied and disassembled portions of the Sony BIOS.[145]

Connectix admits to the copying of Sony's protected material while reverse engineering the Playstation, but asserts the affirmative defense of fair use.[146] Drawing heavily on it previous opinion in *Sega Enterprises Ltd. v. Accolade, Inc.*,[147] the court finds fair use.[148] Software is written in object code that can not be read by humans. Therefore, the unprotected ideas and functions of the code can not be discovered without investigating and translating the material, which requires copying of copyrighted material.[149] "Where disassembly is the only way to gain access to the ideas and functional elements embodied in a copyrighted computer program and where there is a legitimate reason for seeking such access, disassembly is a fair use of the copyrighted work, as a matter of law."[150] When working through the fair use analysis, the court stated an important factor that is needed for fair use defense to apply to an emulator derived from reverse engineering: whether the reverse engineering methods used were necessary to gain access to the unprotected functional elements within the program.[151] The court found in favor Connectix in this case and then went through a fair use analysis. In the end, the court ruled against Sony and ruled that Connectix was protected from the suit.

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[144] *Id*. at 600-01.
[145] *Id*. at 601.
[146] *Id*. at 602.
[147] Sega Enterprises Ltd. v. Accolade, Inc., 977 F.2d 1510 (9th Cir. 1992).
[148] *Sony*, 203 F.3d at 602.
[149] *Id*.
[150] *Sega Enterprises*, 977 F.2d at 1527-28 (quoting *Sony*, 203 F.3d at 602).
[151] *Sony*, 203 F.3d at 603.

The ruling in this case does not protect all emulator creators, however. The Virtual Game Station did not contain any of Sony's copyrighted material.[152] If the programmers use copyrighted code in their emulators, they would not be protected under this decision. It does not allow copying of code into the emulator which would simply create a derivative work.

CONCLUSION

Unfortunately for the classic game fanatics out there, the emulation scene may soon be deluged with lawsuits. Although the emulators themselves are legal, the games to be played on them are not because they violate the Copyright Act of 1976. Unfortunately for the copyright holders, the gamers are able to hide in the massiveness of the Internet. It would be impossible for the companies to find and shut down every emulation site. In the last year, the IDSA managed to shut down 400 sites, which comprises less than one percent of the estimated total.[153] The best course of action for the video game companies would be to start emulation sites of their own and stem the tide of illegal pirating.

[152] *Id*. at 598.
[153] Chris Taylor, *Video Games Get Trashed Now that PCs Can be Turned Into Playstations, the Internet is Flooded with Free and Illegal Games*, TIME, Mar. 15, 1999, at 72, *available in* 1999 WL 7394440.