

Before the United States Copyright Office,
Library of Congress

In the Matter of Rulemaking)
from Prohibition on) Docket No. RM 2002-04
Circumvention of Technological Measures)
That Control Access to Copyrighted Works)

Comments of 321 Studios, LLC
In Response to Copyright Office Questions

On behalf of 321 Studios, a St. Louis, Missouri-based company that offers software titles developed to enable consumers to copy lawfully-obtained DVDs for fair use time-shifting, space-shifting, and backup purposes, we submit responses to specific questions posed by the Copyright Office, by letter to Robert Moore dated June 5, 2003.

I. Region Coding:

A. *Can region coding on DVDs embodying audiovisual works be changed or turned off without decrypting CSS?*

First, we should explain that there are three levels of "region coding:"

1. RPC-I (Regional Playback Control, phase I: see www.dvdcca.org/rpc.html) allowed computer-based player software to take responsibility for implementing region code functions. RPC-I drives, which do not themselves enforce region coding, could not be sold to consumers after January 1, 2000.
2. RPC-II implements stronger protection by requiring the drive itself to check its stored region code against the set of region codes the DVD permits.
3. RCE (Regional Code Enhancement), an additional protection mechanism, was introduced in late 2000 to protect titles released for Region 1 (North America). Under RCE, the DVD movie uses a software mechanism to verify that the player is a "Region 1 only" player while the movie is playing.

The region code information embedded in a DVD cannot be changed, because DVD movies are not in a format that users can write over. Therefore, in order to change or turn off region coding, a user must perform one of the following tasks, only the second of which avoids unauthorized decryption of CSS:

1. Decrypt and copy the content of the DVD to another disc;
2. Physically modify a licensed player to defeat the region coding mechanism; or
3. Use a non-licensed software player that ignores region coding.

The first scenario involves bypassing region coding by copying DVD content to another disc. CSS is necessarily implicated, because one cannot access the content on a CSS-protected disc without first unlocking the DVD drive and decrypting the data. The protocol for unlocking the DVD drive requires competent knowledge of CSS operation. Moreover, making a usable copy of encrypted content is difficult because the writable DVD media that is commercially available to consumers has a burned out "hidden sector," where the CSS decryption keys necessary for decrypting the movie must be stored. With this sector disabled, it is not possible, using consumer equipment, to produce a faithful copy of a DVD that preserves CSS in functional form. Hence, the only way for a consumer to produce a usable copy of a movie in the DVD format is to first unlock the drive and decrypt the movie, which produces a plain MPEG2 file that does not require a hidden sector to play. This MPEG2 file may then be stored on a writable DVD or hard drive. MPEG2 files do not contain a region coding mechanism.

The second means of bypassing region coding, which involves physical modification of a DVD CCA-licensed player, is widely practiced in Europe and is also an option for consumers in the United States. An early approach to this form of self-help was to make the player "region-free" by setting its region code to zero. However, newer DVD titles will not play on region-free

drives. An alternative is to make a player "multi-region," allowing it to automatically switch its region code to match whatever region is required by a particular disc. Although RCE has been deployed to detect this activity and prevent discs from working on multi-region players, newer player modifications have been developed that may mask the practice and defeat RCE.

The third means of bypassing region coding involves use of a non-licensed software player that ignores the region coding on a disc. This practice is common among users of the Linux operating system, for which players licensed by the DVD CCA are still not commercially available. Several non-licensed software players are available free on the Internet in both Linux and Windows versions. These players must decrypt CSS in order to play a movie.

B. Can a licensed player be modified by an owner of that player to circumvent region coding without also circumventing CSS?

Many licensed DVD players can be physically modified to effectively disable region coding by reprogramming the firmware (software stored in a ROM memory chip inside the drive). Information on how to do this is available on the Internet at sites such as www.pioneerdvdrpc1.org. The operation requires technical sophistication on the part of the consumer and voids the warranty. In addition, a player modified in this fashion would no longer be considered to be licensed by the DVD CCA, which effectively means that any use of the player to view a DVD movie could be deemed a circumvention of CSS in violation of the DMCA.

The operation of some licensed software DVD players can also be altered through use of an add-on product that is designed to defeat region coding. A Chinese product called "DVD Region-Free" is said to work with PowerDVD, WinDVD, DirectDVD, Windows Media Player,

and several other software players. The vendor indicates that it disables all levels of region coding: RPC-I, RPC-II, and RCE.

It is the position of the DVD-CCA that licensed players which are susceptible to modification are illegal. Quoting from www.dvdcca.org/faq.html:

Q. Under the terms of the CSS licensing agreement, is it legal for a licensed manufacturer to produce and sell a product which allows a user to disable any CSS protections?

A. No. Such products are not allowed under the terms of the CSS license. They are illegal. In cases where DVD-CCA learns of such products, immediate action is taken through the manufacturer to have the product corrected to conform with the CSS license.

Most consumers who wish to bypass the region coding on DVDs do so by purchasing a player that has already been "chipped" by an aftermarket vendor. Such players sell in the U.S. at a premium of \$150 to \$200 over unmodified models. A list of vendors can be obtained by doing a Google search on "region free DVD." To the best of our knowledge, none of these vendors are authorized to sell such modified players. Therefore, in the absence of an exemption from the Copyright Office, consumers who use these players may risk liability under the DMCA.

C. If region coding cannot be changed or turned off without circumventing CSS, is it technically possible to design the protection system in a way that would make this possible? In other words, is it possible to place the region coding outside of the CSS shell?

In theory, it is technically possible to design an access control system so that all of the controls are functionally separate from one another. However, the creators of CSS did not choose to design the system in this manner. As that system is currently designed, region coding is necessarily inside the CSS shell because one cannot unlock the drive without knowledge of the CSS decryption algorithm.¹ Furthermore, with RCE, the region coding is embedded in the

¹ Courts have not yet determined whether this locked drive functionality constitutes an access control.

movie itself, which is encrypted using CSS.

II. Fast Forward Function

- A. Can the disabling of the fast-forward function or the UOP locking commands of a DVD be reversed or altered, thus reactivating the fast-forward function, without decrypting CSS?*

For all practical purposes, no. Since a commercial film distributed on DVD cannot be modified by the user, there is no way to alter a UOP blocking directive that is incorporated into the disc. However, the fast-forward function can be reactivated by copying content from a DVD onto another disc, and then deleting the UOP blocking directive from that copy. Copying in this manner necessarily implicates CSS, as described above in the discussion of the first means of bypassing region coding.

In theory, UOP blocking can also be disabled by modifying the software embedded in the DVD player. However, such a modification would require a substantial reverse engineering effort. Therefore, the only practical way for most consumers to disable UOP blocking is either to copy content from the DVD onto another disc and then delete the blocking directives from that copy, or use a player that doesn't enforce UOP blocking in the first place. Unlicensed players such as Xine, Videolan, Ogle, and Mplayer do not enforce UOP blocking, but they necessarily decrypt CSS in order to play a movie.

- B. If UOP blocking commands cannot be changed or turned off without circumventing CSS, is it technically possible to design the protection system in a way that would make this possible or does the nature of the DVD medium preclude this?*

The UOP blocking mechanism does not depend on CSS technologically. However, the UOP blocking commands are effectively dependent on CSS for two reasons: First, although UOP blocking commands can be avoided by copying content from a DVD onto a another disc and then deleting the UOP blocking commands from that copy, this cannot be accomplished

without first unlocking the drive and decrypting the CSS-encoded content. Second, DVD CCA licensing terms force manufacturers to make playback devices resistant to modification, thereby preventing consumers who resent the UOP blocking commands from bypassing them by modifying a licensed player.

III. DVD Life Span and Failure Rates

A. What is the average life span of a DVD? What is the Estimated Failure Rate of DVDs?

The life span of a DVD is dependant on many factors, some controllable by consumers, others not. Moreover, because the many DVD formats (to be discussed below) incorporate design differences, each type of DVD is susceptible to different forms and rates of degradation. It is clear, however, that content industry claims regarding the durability and longevity of DVDs have in a few short years since the introduction of the DVD format proven to be wildly exuberant and divergent from the actual experience of many consumers. Industry claims about the life span of DVDs, along with evidence establishing that these claims are inconsistent with reality, are discussed below.

1. Background: The Structure of a DVD

As a preliminary matter, it is important to note that there are many different DVD formats, each manufactured to serve a different function. DVDs may be either recordable/write once (DVD-R, DVD+R), recordable/rewritable (DVD-RW, DVD+RW, DVD-RAM), or read only (DVD-ROM, DVD-Video, DVD-Audio). Although the structure of a DVD varies somewhat by disc type, all DVDs are forms of optical media, meaning that laser light is used to retrieve data from, and in some instances write data to, the disc. Accordingly, all DVD types share three main components: a polycarbonate substrate (plastic) layer, a data layer, and a metal layer. The polycarbonate substrate layer provides the disc with enough strength to remain flat

and with the proper depth to maintain laser focus on the underlying metal and data layers. The metal layer or layers—comprised of aluminum, gold, silver, silver alloy, or in “double layer” DVDs, silicon—enable the laser beam to be reflected back to the photosensor in the playback device.

The data layer of a DVD holds the bits that comprise the content that is stored on the disc. The data layer in recordable DVD-R and DVD+R discs is comprised of photosensitive dye into which data is written by means of a chemical change effected by laser light. The dye is sandwiched between the polycarbonate substrate layer and the reflective metal layer. The data layer in a recordable/rewritable DVD (DVD-RW, DVD+RW, or DVD-RAM) consists of a phase-changing metal alloy film to which data is written by means of a laser beam heating the film and causing a phase change (crystallization). The film, which is surrounded by dielectric layers that cause rapid cooling to preserve the crystallization, is sandwiched between the polycarbonate substrate layer and the reflective metal layer. On DVD-ROM, DVD-video, and DVD-audio discs, data is not actually stored in a separate layer; rather, it is molded as “pits” (depressions) and “lands” (surfaces) into the inner surface of the polycarbonate substrate layer. The reflective metal layer is then sputtered or condensed directly onto the molded substrate to form the “reflective-data layer.”

Unlike compact discs, DVDs do not use lacquer coating to protect the metal layer from exposure to the environment; instead, a polycarbonate substrate layer is bonded to each side of the disc. A label or printed surface may be added over one of the polycarbonate substrate layers on some DVDs.

2. Forms and Causes of DVD Failure

Several common forms of DVD degradation, along with identified causes, are discussed below.

a. Data Layer Degradation, Generally

The primary source of disc degradation, and ultimately failure, is the effect of environmental influences on the dye-based, film-based, or aluminum-based data layer of a DVD.

² The mechanism by which this degradation occurs varies according to the type of DVD.

For example, the transformation worked when data is written into the dye-based data layer in a recordable/write-once DVD (DVD-R or DVD+R) inevitably degrades over time, making the data unreadable by laser. Prolonged exposure to ultraviolet light, and certain levels of humidity or temperature, will accelerate this degradation.³ In recordable/rewritable discs (DVD-RW, DVD+RW, DVD-RAM), the phase-change alloy film chemically degrades over time and loses its ability to hold phase-changed data marks. Certain levels of temperatures and humidity will accelerate this degradation.

b. Reflective-Data Layer Degradation (DVD “Rot”)

The most favored DVD formats for distributing mass-market audio, video, game, and computer application products are read-only DVD-ROM, DVD-Video, and DVD-Audio, which are also referred to as pressed or replicated discs. In contrast to the dye-based and film-based data layers in other types of discs, the “pits” and “lands” pressed into the polycarbonate substrate on a DVD ROM are relatively stable. This relative stability has led some to surmise that replicated discs should be the longest lasting among disc types. However, the metal that is

² See National Institute of Standards and Technology, Information Technology Laboratory, Convergent Information Systems Division, NIST Special Pub. 500-252, *Information Technology: Care and Handling for the Preservation of CDs and DVDs: A Guide for Librarians and Archivists* (2003) (hereinafter “NIST Special Pub. 500-252”), at 12.

³ NIST Special Pub. 500-252, at 21.

applied to the pressed side of the polycarbonate substrate to create the “reflective-data layer”⁴ in a replicated DVD is almost invariably aluminum.⁵ Favored by manufacturers because it is inexpensive and easy to apply, aluminum is also highly susceptible to oxidization. This oxidization—also known as DVD “rot”—diminishes the reflectivity of the disc, eventually making it unreadable by laser.

The phenomenon of DVD “rot” is not limited to replicated discs. DVD-RW, DVD+RW, and DVD-RAM discs also incorporate aluminum reflective layers, and are also subject to oxidization. However, because the phase-changing film used in these discs tends to degrade more quickly than the aluminum reflective layer, DVD “rot” is not usually the primary factor in RW and RAM disc failure.⁶

It is generally agreed that certain levels of temperature and environmental humidity will increase both the likelihood and the rate of DVD “rot.” Going from a relatively cold climate to a warmer one may also cause moisture condensation on the disc, promoting “rot.”

However, opinions with respect to the parameters of acceptable storage conditions vary. The International Organization for Standardization (ISO), a international network of national technical standards institutes with 146 member nations,⁷ recommends storage of DVDs at temperatures ranging from 14° F to 73° F, with relative humidity of 20% to 50%.⁸ The U.S.

National Archives and Records Administration recommends storage at 68° F and 40% humidity,

⁴ NIST Special Pub. 500-252, at 14.

⁵ On a double-layered disc, one of the metal layers is composed of a semi-reflective material (silicon, gold, or silver) that allows some of the laser beam to reflect back immediately and some of the laser beam to pass through to the fully reflective aluminum layer before being reflected back to the photosensor in the laser head. See NIST Special Pub. 500-252, at 10.

⁶ NIST Special Pub. 500-252, at 10.

⁷ The U.S. representative to the ISO is the American National Standards Institute, 1819 L Street, NW, Washington, DC 20036.

⁸ NIST Special Pub. 500-252, at 20 (citing ISO TC 171/SC Jan. 2002).

with a maximum temperature gradient (change) of +/- 1° F/day.⁹ Much of the United States is exposed to ambient temperature and humidity levels above the optimum range for protecting or preserving DVDs. Thus, it is understandable that as DVDs become more established in commerce, there will be increasing consumer exposure to DVD “rot.”

c. Delamination

Flexing or bending a DVD may eventually cause the disc layers to separate, a phenomenon that is known as delamination. Although it is not currently known how much stress from flexing a disc can tolerate before sustaining damage,¹⁰ the packaging in which DVDs are typically distributed to the public has been identified as a primary cause of flex-related stress and delamination.¹¹ Few consumers are adept at removing and returning a disc from/to the “hub,” or center ring, of its package without causing some flex-related stress to the disc. Storing a DVD horizontally for a long period of time, particularly in high temperatures, can also cause the disc to become permanently bowed, separating in some areas.¹² The bonding between disc layers may also be weakened by environmental temperature changes, because the layers of a DVD may expand and contract at different rates.¹³

d. Physical Damage from Ordinary Use

Although environmental factors will eventually cause deterioration of the exterior polycarbonate substrate layers of a DVD, this deterioration occurs at a much slower rate than

⁹ NIST Special Pub. 500-252, at 20 (citing National Archives and Records Administration (NARA), FAQ About Optical Media (2001). The DVD Specification, which incorporates an early-developed standard, recommends that discs be stored at a temperature in the range of -4° to 122° F, with less than 27° F variation per hour, at relative humidity of 5% to 90%.

¹⁰ NIST Special Pub. 500-252, at 28.

¹¹ *Id.*

¹² *Id.*

¹³ *Id.* at 19.

environmental degradation of the data and reflective metal layers.¹⁴ Therefore, the impact of environmental factors on the exterior plastic layers of a DVD is not considered a primary cause of DVD “end-of-life.”¹⁵ However, the relative softness of polycarbonate renders the outermost layers of a DVD vulnerable to the effects of ordinary physical handling.¹⁶ Fingerprints, smudges, scratches, dirt, dust, solvents, and any other foreign material can interfere with the ability of the laser to reliably read data from the internal data or reflective-data layer.¹⁷

Earlier this year, to estimate the public’s need to backup its DVD investments, 321 administered a national survey targeting consumers who have Internet access. The survey, which sought to identify consumers' reasons for making back-up copies of DVDs, was administered on 321 Studios’s website via an opt-in mechanism. The survey garnered participation from 1,169 unique visitors, and established that more than 1 in 3 respondents had experienced some problems with playback of a DVD. Of those who stated that they had experienced playback problems, 8% attributed those problems to DVD rot, corrosion, or delamination; 2% cited temperature and humidity causes; 20% identified wear and tear from normal use; and 21% attributed DVD failure to accidental damage.¹⁸

Significantly, not all physical damage to DVDs can be attributed to consumers.¹⁹ DVD degradation may also be attributable to decision-making and handling at the manufacturing, distribution, and retail levels, including inartful package design, less-than-optimal shipping and handling conditions, or exposure to dirt, dust, or solvents prior to retail sale.²⁰

¹⁴ *Id.* at 12.

¹⁵ *Id.*

¹⁶ *Id.* at 8

¹⁷ *Id.*

¹⁸ Further information related to this survey will be provided to the Copyright Office upon request.

¹⁹ *See, e.g.*, Melodie Gee, Remarks at the Fourth Annual Conference of the DVD Association (DVDA), Gaithersburg, Maryland (June 10-11, 2003) (hard copies and related materials forthcoming); *infra* note 33.

²⁰ *Id.*

5. *Player-Disc Incompatibility*

Compatibility problems among DVDs and DVD playback devices is an additional cause of playback failures experienced by consumers.²¹ Although some compatibility problems are attributable to the fact that certain playback devices are not designed to support all DVD formats, nearly all mass-market playback devices are designed to support the DVD-ROM and/or the DVD-Video and DVD-Audio formats.²² Accordingly, the compatibility problems experienced by users of replicated DVDs are most likely attributable to other factors within the control of DVD authors, publishers, manufacturers, replicators, and hardware manufacturers, including the manufacturers of playback devices that have been licensed by the DVD CCA.

One major cause of disc-player compatibility problems is a wide variance in reflectivity levels among DVD formats and brands.²³ As promulgated by the DVD Consortium (a group comprised of the ten companies that originated the format), the DVD specification states that single layer DVDs should have a reflectivity between 45 percent and 85 percent, and dual-layer discs should have a reflectivity between 18 percent and 30 percent.²⁴ However, preliminary analysis suggests that disc manufacturers have had difficulty measuring and standardizing reflectivity during the manufacturing process, and that not all players are fully compatible with discs at the lower end of the reflectivity standard²⁵ The less reflective a disc, the less likely a player is to read it reliably.²⁶

²¹ See, e.g., Bob Zollo, Ralph LaBarge, Remarks at the Fourth Annual Conference of the DVD Association (DVDA), Gaithersburg, Maryland (June 10-11, 2003) (hard copies and related materials forthcoming); *infra* note 33.

²² *Id.*

²³ See, e.g., Ralph LaBarge, Remarks at the Fourth Annual Conference of the DVD Association (DVDA), Gaithersburg, Maryland (June 10-11, 2003) (hard copies and related materials forthcoming); *infra* note 33.

²⁴ *Id.*

²⁵ See, e.g., Information Technology Laboratory, Convergent Information Systems Division (CISD), National Institute of Standards and Technology, Data Preservation Program Home Page, at <http://www.itl.nist.gov/div895/isis/datastorage.html>; Bob Zollo, Ralph LaBarge, Remarks at the Fourth Annual

A second cause of disc-player compatibility problems is increasingly sophisticated DVD authoring. Recently-authored discs, which test the outer limits of the DVD specification, are especially likely to behave strangely or fail to play reliably on many playback devices that were considered state-of-the-art just a few years ago.²⁷

A third cause of disc-player compatibility problems is a wide variance in design and manufacturing quality among DVD brands within a particular disc format.²⁸ According to one study, many playback devices play some brands of DVDs within a particular format flawlessly, demonstrate marginal playback on other brands, and fail to mount other brands at all.²⁹ Only ten percent of players tested played all 39 formats and brands of recordable media correctly.³⁰ Ninety percent had inconsistent results, playing some formats or brands of media well but playing back marginally on other formats and brands.³¹

3. Current Research into DVD Life Span and Failure Rates

Unofficial estimates put the number of DVDs affected by “rot” and delamination at something in the range of one to ten percent.³² “Official” DVD failure rates and life span estimates are not readily available at this time. However, the recent initiation of studies by technological standards organizations and trade associations within the optical media industry

Conference of the DVD Association (DVDA), Gaithersburg, Maryland (June 10-11, 2003) (hard copies and related materials forthcoming); *infra* note 33.

²⁶ See Bob Zollo, Ralph LaBarge, Remarks at the Fourth Annual Conference of the DVD Association (DVDA), Gaithersburg, Maryland (June 10-11, 2003) (hard copies and related materials forthcoming); *infra* note 33.

²⁷ For a list of replicated discs and players with identified compatibility problems, see Jim Taylor, DVD Demystified, DVD Frequently Asked Questions, at 28-32, *available at* <http://www.dvddemystified.com/dvdfaq.html> at pages 28-32 (last modified June 9, 2003; last visited June 20, 2003).

²⁸ See, e.g., Ralph LaBarge, Remarks at the Fourth Annual Conference of the DVD Association (DVDA), Gaithersburg, Maryland (June 10-11, 2003) (hard copies and related materials forthcoming); *infra* note 33.

²⁹ *Id.*

³⁰ *Id.*

³¹ *Id.*

³² Sue Lowe, *A Bad Case of DVD Rot Eats Into Movie Collections*, Sydney (Australia) Morning Herald, Feb 1, 2003.

confirms that the longevity and durability problems reported by DVD users are both real and economically significant.³³

In recognition of the fact that DVDs are now a popular format for motion picture distribution, as well as a promising medium for the storage and preservation of other forms of content, comprehensive research into factors bearing on DVD life span and failure rates has been initiated by the U.S. National Institute of Standards and Technology (NIST) and the Optical Storage Technology Association (OSTA).³⁴ NIST has developed techniques for enabling localization and laboratory analysis of DVD defects that are attributable to environmental and other aging related factors.³⁵ These techniques involve the use of a high-magnification microscope, interference filter, mercury lamp light source, and a Blue-M environmental chamber designed to accelerate the aging of DVDs by controlled exposure to temperature and humidity stresses³⁶ Although testing is still in preliminary stages, data from the studies will be used to estimate the life expectancy of DVDs under normal storage conditions. A stated goal of the

³³ The instant comments have been informed by preliminary research into factors bearing on DVD longevity, durability, and compatibility, as presented by representatives of the NIST, the DVD Association (DVDA), and the Optical Storage Technology Association (OSTA) at the Fourth Annual NIST/DVDA Conference held in Gaithersburg, Maryland on June 10-11, 2003. 321 Studios has requested copies of materials generated in connection with these presentations, and anticipates that some materials will become available in the next few weeks. As soon as 321 Studios receives these materials, we will submit them to the Copyright Office. If permission to file these materials is required, 321 hereby requests such authority.

³⁴ See, e.g., Information Technology Laboratory, Convergent Information Systems Division (CISD), National Institute of Standards and Technology, Data Preservation Program Home Page, at <http://www.itl.nist.gov/div895/isis/datastorage.html>; (last visited June 20, 2003); Bob Zollo, Ralph LaBarge, Remarks at the Fourth Annual Conference of the DVD Association (DVDA), Gaithersburg, Maryland (June 10-11, 2003) (hard copies and related materials forthcoming); *supra* note 33. For more information on studies being conducted by the U.S. NIST, contact Xiao Tang, group leader, Information Storage and Integrated Systems, NIST, Convergent Information Systems Division. Phone: 301-975-2503. Email: xiao.tang@nist.gov.

³⁵ See Pierre L'Hostis, Frederick Byers, Fernando Podio, and Xiao Tang, Information Technology Laboratory, Convergent Information Systems Division (CISD), National Institute of Standards and Technology, *Microscopic Image Analysis of Defect Areas in Optical Disks*, Invited Paper, SPIE Conference on Recent Advances in Metrology, Characterization, and Standards for Optical Digital Data Disks, Denver, Colorado (July 1999), available at http://www.itl.nist.gov/div895/docs/xiao_tang_microscopic_image_analysis.pdf (last visited June 20, 2003).

³⁶ *Id.*

program is to work with industry to help in their efforts at improving the reliability and interoperability of optical discs, including DVDs.³⁷

NIST has also initiated testing to address recognized problems in the areas of compatibility and disc reflectivity.³⁸ Although final research data has not yet been released, the compatibility studies are expected to shed light on the connection between the number of errors on a disc and compatibility related playback problems.³⁹ The reflectivity studies are expected to assist DVD manufacturers in standardizing disc reflectivity and maintaining quality control during the DVD production process.⁴⁰ An NIST-developed methodology for measuring reflectivity has been touted as “more accurate and more trustworthy than the traditional methods used in the optical discs industry.”⁴¹

B. What Are The Specific Marketing Claims For Works Distributed On DVDs In Terms Of Life Span And Are These Claims Different From The Reality, If At All?

Since their commercial introduction, optical disc media such as DVDs have been marketed to consumers by the content industries on the basis of the medium’s superior durability and longevity. Marketing claims boasting of the durability of DVDs have been especially pervasive. The following is a sampling of industry leaders' comments:

"The copy never wears out. It is that durability which provides the DVD (Digital Versatile Disc) with its grandest asset..."

Jack Valenti, testimony offered to the Senate Committee on Foreign Relations, Feb. 12, 2002, available at

www.mpaa.org/jack/2002/2002_02_12b.htm (last visited June 16, 2003).

³⁷ See, e.g., Information Technology Laboratory, Convergent Information Systems Division (CISD), National Institute of Standards and Technology, Data Preservation Program Home Page, at <http://www.itl.nist.gov/div895/isis/datastorage.html>; (last visited June 20, 2003).

³⁸ *Id.*

³⁹ *Id.*

⁴⁰ *Id.*

⁴¹ *Id.*

"But you've already got a DVD. It lasts forever. In the digital world, we don't need back-ups, because a digital copy never wears out. It is timeless."

Jack Valenti [responding to the lack of need for back-up copies], quoted in Derek Slater, *Valenti's Views*, The Harvard Political Review, April 10, 2003, available at www.hpronline.org/news/347207.html (last visited May 14, 2003).

Sony Pictures Television president Mel Harris described DVD as "well-built," and Brad Burnside, owner of Video Adventures and a former VSDA chairman, "said he looks forward to DVD because of... the durability of the discs compared with magnetic tape."

Jane Greenstein, *DVD Proponents Cite Benefits*, Video Business, June 2, 1995, at 16 (reporting on presentations made at the New Technology Super Session).

"The mission of the group is to establish a single, consistent voice to communicate the key benefits of the DVD video experience, including... exceptional durability."

Emile N. Petrone, chairman of the DVD Video Group (including on its executive committee executives from MGM/UA Home Video, Inc., LIVE Entertainment, Toshiba American Consumer Products, Warner Home Video, and Phillips Electronics), *DVD Video Group Speaks Up*, Billboard, Aug. 9, 1997.

The "failure rate of DVDs and CDs is way less than 1 percent," so backup copies are unnecessary.

Ron Wheeler, Fox Entertainment SVP, in a keynote speech, quoted in Bruce Apar, *Rights Holders Cry Foul on Fair Use Abuse*, Video Store, Nov. 3, 2002, at 7.

"The reality seems to be that DVDs are incredibly reliable, unless you give them to dog Spot and let him run around with it in his mouth for a while."

Scott Dinsdale (MPAA's advisor on digital strategy), quoted in Bruce Orwall, *Burning Desire: Hollywood is Determined to Prevent Unauthorized Copying of Movies*, The Wall Street Journal, May 19, 2003, at R4.

As to the public's perception, the exaggerated claims made by industry leaders are routinely repeated in press reports, to wit:

"Never wears out, never needs rewinding."

Mike Snider, *New Generation Digital Disc has Industry Abuzz*, USA Today, Jan. 3, 1996, at 1A.

DVDs, "unlike tape, do not wear out or deteriorate. Just don't leave them in the front seat of your BMW on a summer day."

Stephen Williams and Joseph Gelmis, *Everything You Need to Know About DVD*, Newsday, Mar. 30, 1997, at C21.

"DVDs won't wear out, as tapes can..."

Martie Zad, *The DVD Pitch*, The Washington Post, April 12, 1998, at Y05 (detailing an interview with Paul Culberg, executive vice president of Columbia TriStar Home Video).

"There's no question that the [DVD] format has the durability that is a big advantage..."

Anne Sherber, *Buena Vista, Lyric Serve Up Kids' DVDs: Format May be Good Fit for Families*, Billboard, Sept. 11, 1999.

"The discs are also more durable than cassettes, and expected to last virtually forever, while tape tends to fade after 15 or 20 years."

Thomas K. Arnold, *Hot DVD Releases Fire Up Collectors*, USA Today, Oct. 15, 2001, at 10D.

"DVDs, which look identical to compact discs, are sturdier than tapes: They don't 'shed,' and since only a beam of light reads the data, DVDs don't wear out."

Stephen Williams, *A Crash Course in DVD 101*, Newsday, Dec. 15, 2002, at D16.

The unqualified claims made by industry spokespersons about the durability and longevity of DVDs stand in sharp contrast to the opinion expressed by MPAA spokesperson Fritz Attaway at the May 2, 2003 hearing before this Office. At that hearing, Mr. Attaway stated, "I don't believe that there is any expectation that when I purchase this DVD it will last forever." Tr. at 104. Mr. Attaway further explained, "People realize when they buy a DVD that if they leave it out in the sun it's going to melt." *Id.* Bruce Turnbull, representing DVD CCA, added that "if you bought a DVD that never played," that would be "a different issue and perhaps some other agency of Government would be worried if the retailer and the producer didn't take it back in that kind of circumstances." *Id.* at 105.

C. Loss of Access to Personal Digital Assets: An Acute Problem for Consumers

There is a broad consensus among technology experts and archivists that DVDs are not as stable a physical storage media as traditional analog media such as paper or film.⁴² Since at least the early 1990s, libraries, archives, and government entities within the United States and abroad have been actively working to preserve access to the “digital heritage” by developing preservation standards and launching collaborative archiving initiatives.⁴³ Indeed, prestigious organizations like NIST have recognized that archiving, “out of necessity, is becoming more of an on-going technological strategy to ensure continued, long-term access to stored collections.”⁴⁴ NIST recommends that archival copies of digital works be made and designated as “frequently accessible copies,” with the original digital copies retained and designated as limited use archival copies.⁴⁵

Despite recognition at the federal level of the need for a systematic approach to preserving access to digital media, little has been done to ameliorate the current and imminent loss of access, by ordinary consumers, to digitally-represented works in their private home media collections. The Section 1201 exemption issued by the Copyright Office in 2000, which permitted consumers to circumvent access control mechanisms that fail to permit access to

⁴² See, e.g., Information Technology Laboratory, Convergent Information Systems Division (CISD), National Institute of Standards and Technology, Data Preservation Program Home Page, at <http://www.itl.nist.gov/div895/isis/datastorage.html>; (last visited June 20, 2003) (“Storage on digital optical media has the advantage of large capacity, fast access rate and lossless information transfer [. However,] the lifetime of this storage media is limited because of chemical and physical deterioration as well as the obsolescence of the format and playback technology. Methods are being developed here to determine the life expectancy of various digital data storage discs as an application guideline for production and data preservation of the digital storage media.”)

⁴³ See, e.g., *Preserving Digital Information, Report of the [U.S.] Task Force on Archiving of Digital Information*, Commissioned by The Commission on Preservation and Access and The Research Libraries Group, Inc. (1996), available at <http://www.rlg.org/ArchTF/> (last visited June 20, 2003). For additional information on efforts to preserve access to digital media, see Council on Library and Information Resources, Home Page, available at <http://www.clir.org> (last visited June 20, 2003).

⁴⁴ See, e.g., NIST Special Pub. 500-252, at 5 (citing Kyong-Ho Lee et al, Information Technology Laboratory, Convergent Information Systems Division, National Institute of Standards and Technology, *The State of the Art and Practice in Digital Preservation* (2002).

⁴⁵ See, e.g., NIST Special Pub. 500-252, at 6.

literary works because of malfunction, damage, or obsolescence, was a meaningful step in the right direction. We urge the Office to renew that exemption. However, an exemption that permits consumers to circumvent technological access controls that have already malfunctioned or become obsolete falls far short of empowering consumers to access and make noninfringing uses of their own DVD assets for a period of time that is commensurate with the entertainment industry claims—that DVDs are “timeless,” “never wear out,” and “last forever”—which undoubtedly informed consumer decisions to purchase home movies in the DVD format.

If a DVD or other physical storage medium deteriorates before the binary code that is stored on it that device has been “refreshed,” or copied, onto another physical medium, access to the content that is represented by that code will be lost—in many instances, irretrievably. Moreover, it is impossible to predict when a particular DVD has deteriorated to the point where failure is imminent. Many forms of DVD degradation—including “rot,” partial delamination, and chemical changes within the data layer of a disc—are invisible to the naked eye. Moreover, although DVD failure is progressive, the error detection and correction codes that are programmed into DVDs are likely to prevent consumers from noticing a degradation of disc performance before the problem becomes catastrophic. A full explication is beyond the scope of this document, but it is helpful to understand that error detection and correction codes function by using redundant encoding to enable data that is in transit (from a DVD to a playback device, for example) to be tested and corrected for accuracy. The Reed-Solomon Codes used in connection with DVDs are particularly useful for correcting “bursts” of consecutive bit errors, such as those caused by “rot” or other degradation of the physical disc. Although the likelihood of imminent disc failure increases along with the number of bit errors on a disc, the presence of errors will not ordinarily be noticed by a DVD user until the capacity of the disc’s error

correction code has been exceeded, resulting in a playback failure. The number of errors that can be present on a disc before a failure will result cannot be determined, because it depends on how the errors are distributed within the data.⁴⁶

Because it is difficult if not impossible for the average consumer to predict when a DVD might fail, the practice of backing up discs is a responsible means of preserving access, for noninfringing purposes, to works in one's personal DVD collection. Moreover, in view of the pervasive content industry claims that acquiring a DVD means acquiring access to the content thereon "forever," the practice of making personal backup copies of lawfully-made and acquired DVDs must be viewed as a noninfringing use of the works stored thereon, with no economic significance apart from rights for which the copyright owner was compensated in the original DVD purchase. For the first time, products such as 321 Studios' DVDX Copy have given ordinary consumers a practical means of maintaining ongoing access to works in their personal DVD collections. By exploiting the fact that error correction coding may work more efficiently when a DVD is accessed in a computer drive as opposed to a T.V.-top player, 321 Studios' products can in some instances also be used to restore access to DVD content when a partial disc failure has already occurred.⁴⁷

Digital technology is evolving rapidly. New devices, processes and software are replacing the products and methods used to record, store, and access digital information in rapid cycles of approximately five to seven years.⁴⁸ Content embodied on obsolete technologies will quickly become inaccessible for noninfringing uses unless consumers have both the legal and

⁴⁶ NIST Special Pub. 500-252, at 12.

⁴⁷ From the perspective of consumers, any skipping, unusual jitter, or "dropout" of portions of the audio or video content that comprise a motion picture may so reduce the utility of that DVD as to constitute a "failure" of the disc for purposes of ordinary use.

practical ability to periodically copy, or “refresh,” their home media assets onto usable storage media.

An exemption to permit the use of software products such as those distributed by 321 Studios would enable consumers to address the loss of access to copies of works in their home media collections that is likely to result from the imminent obsolescence of particular formats and access control mechanisms. To be sure, consumers could address technological obsolescence, as well as compatibility problems, by purchasing and preserving a multitude of playback devices, each compatible with a different format and brand of media. That is not a realistic or fair marketplace solution. Alternatively, consumers could be authorized to bypass access controls for the purpose of migrating content from their lawfully-acquired DVDs onto discs that can be played in devices they already own. The necessary technology is already available.⁴⁹

IV. Public Domain Works

Please provide the details concerning any instances you are aware of in which one or more works in the public domain have been bundled with one or more works protected by copyright, and the bundled works have been protected by a technological measure that controls access to the works in a way that has adversely affected users’ ability to make noninfringing uses of the public domain works.

Because DVDs have large file capacity, distributors of motion pictures often bundle various works together to enhance marketability of their products. As a result, DVDs containing public domain motion pictures are being sold with theatrical trailers, still photographs, copies of original film posters, interviews, production notes, audio commentaries, sketches and

⁴⁸ See, e.g., Julie Schwerin, Remarks at the Fourth Annual Conference of the DVD Association (DVDA), Gaithersburg, Maryland (June 10-11, 2003) (hard copies and related materials forthcoming); *supra* note 33.

⁴⁹ For example, ROM technology being incorporated into new products from 321 Studios will allow content from DVD-RW discs to be migrated to a disc and media brand that is compatible with a device already owned by the

storyboards, credits, television bumpers, outtakes, press releases, screen tests, sound recordings, literary texts and even copyright registration materials. These DVDs, which contain public domain movies and other public domain works, and which are likely to be protected by technological access control mechanisms, may also include works still under copyright. Attached hereto as Exhibit A are 30 data sheets, downloaded from Amazon.com, featuring films in the DVD format that were identified as “public domain” by one or more published sources, e.g., RetroFilm Media International (see www.retrofilm.com/classics.html), Desert Island Films, Inc. (see www.desertislandfilms.com), and Buyout Footage.com (see www.buyoutfootage.com).

Among the films included on “public domain” film lists are "To Kill a Mockingbird" (1962); "Mr. Arkadin" (1955); "Hometown Story" (1951); “Father's Little Dividend" (1951); "Till the Clouds Roll By" (1946); "The 39 Steps" (1935); "The Blue Angel" (1931); "Nosferatu" (1929); and "Birth of a Nation" (1915). 321 Studios has also created an informational DVD featuring film materials which are frequently identified as being in the “public domain,” but which do not appear to be available in alternative, non-encrypted formats. A copy of this DVD is attached hereto as Exhibit B.

321 Studios has not endeavored to conduct its own, comprehensive investigation into the public domain status of these works. A thorough review of the public domain status of hundreds if not thousands of works that are arguably in the public domain and are now being sold on CSS-controlled DVDs is a time-consuming and expensive task, not feasible within the time frame established by the Copyright Office for the preparation of responses to the Office’s post-hearing inquiries. However, it bears noting that during consideration of copyright law reform last century, the Register of Copyrights was asked to advise Congress about the copyright renewal

consumer. This technology is also capable of making content from a DVD+R disc playable on a DVD-R player,

status of registered works. Congress was advised by the Copyright Office, in connection with the reform acts of 1909 and 1976, that only a very small fraction of the copyrights in published works are actually renewed.⁵⁰ Motion pictures and other audiovisual works comprise many of the works shown in Copyright Office records as having expired copyrights. Given the failure of many copyright owners to renew copyright in their motion pictures, it is reasonable to conclude that much of the added-value content that is bundled with those motion pictures for sale on DVD is itself unprotected by copyright.⁵¹

The attached Amazon data sheets provide information about some of the added-value content featured on each of the DVDs shown. Alternative published sources for some of this content (such as movie trailers, posters, photographs and press releases) are few. Significantly, alternative sources for the public domain motion pictures themselves are diminishing. For example, film industry principals have predicted the imminent demise of VHS. According to Ben Feingold, President of Columbia Tri-Star, "within twenty-four months, it will become very difficult to find any titles in video, other than family films."⁵² In sum, since the Copyright Office's determination in the 2000 proceeding that many public domain films continue to be available in alternative, unencrypted formats such as VHS, titles in a format not protected by access controls have become significantly harder to locate.

and vice versa.

⁵⁰ See H.R. Rep. No. 2222, 60th Cong., 2d Sess. (1909), *reprinted in* 8 Nimmer On Copyright App. 13, at 21 ("1909 Act House Report") at 22; H.R. Rep. No. 1476, 94th Cong., 2d Sess. 135, *reprinted in* 8 Nimmer On Copyright App. 4, at 136; U.S. Copyright Office, Register's Report on the General Revision of the U.S. Copyright Law (1961), *reprinted in* 8 Nimmer On Copyright App. 14 at 51.

⁵¹ Distributors who bundle works on a DVD rarely advise consumers about the public domain status of those works. However, since representatives of many of those distributors with direct access to relevant records are participating in this proceeding, they may wish to clarify for the record the status of these bundled works.

Respectfully Submitted,

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⁵² New York Times, Aug. 26, 2002 at 1.