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From: "Karl O. Pinc" <kop@meme.com>
Subject: Comment to the Copyright Office
To: 1201@loc.gov (Office of the General Counsel, Copyright Office,
    Library of Congress)

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The Constitution of the United States, Article 1, Section 8:

To promote the progress of Science and Useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.

Dear Sirs and Madams,

Regarding price:

The first thought that comes to mind as I read your request for comment is that you have many questions with respect to price paid for copyrighted works. It is clear that the method of distribution of copyrighted works is dramatically changing. Copyright is a right to intellectual property, there is no intellectual property that cannot be digitized, and digital works may be distributed for a cost so low as to be, for all intents and purposes, free. While this is not true today, everywhere, and no matter the data volume, it's clear that it will be true soon. Already in some places it is not necessary to go to the video store to rent a video cassette, you can download the movie on demand from the local cable company. There are few or no intellectual properties which contain more data, and hence require more bandwidth, than movies. None I can think of which require orders of magnitude more; and bandwidth is like computers, over time it

becomes cheaper by orders of magnitude. Even traditional paper media, newspapers, books, etc., are someday likely to be distributed digitally; especially now that digital paper is being manufactured. (See http://www.xerox.com/go/xrx/about_xerox/T_release1.jsp?oid=15161&view=news_archive&equip=none) Thus, although we have been served well by them in the past, it is clear that the present channels of information distribution are doomed. It is only a matter of time.

For these reasons, I urge you not to consider the impact on the "street" price of copyrighted materials. This price includes the costs of distribution and manufacture of the physical media of much of todays intellectual property. Instead, you should look to your mandate in Article 1, Section 8 of the U.S. Constitution, which reserves rights "to Authors and Inventors", and consider only the price paid to them. How "street prices" will be set in the digital era is as yet undetermined. However they are set is irrelevant to the matter at hand, for we know that widespread and easy distribution is assured. Costs related to promotion, or to the construction of the necessary capital infrastructure to deliver the generic digital data of the future, fall outside of the scope of this inquiry. The Constitution is only concerned with price as an incentive which encourages the Author to promote progress.

Regarding exemption of a class of work:

I urge you to exclude from the prohibition to circumvent access control technologies all such technologies which do not give the purchaser of the copyrighted work complete access to the plain, unprotected form of the copyrighted data. I am continually frustrated in the restriction of legitimate use in products which do not give me access to the raw data. Here is an example: I considered the purchase of the CD published by the Metropolitan Museum of New York for the Possessing The Past: Treasures from the National Palace Museum, Taipei exhibit. I wished to select one of the images on the CD to use as the screen background on my computer. Due to the CD's copy protection, there was no facility which allowed access to the raw images, you could only access the images using the supplied software. As it happened, my contacts in the industry informed me of this before I made the purchase. The copy protection mechanism restricted the use of the material to such a degree that the material was unusable. The point is, that no software can anticipate the legitimate uses to which

I may put the copyrighted material I purchase, and if it could, no software can do everything. The software on that CD does not even run on the computer I presently use every day. Just as there are myriad legitimate uses of static images, so there are for sound and movies.

To restrict the consumer to the ordinary and expected uses of material which they have purchased, as dictated by the copyright holder through the copy protection mechanism, transfers to the copyright holder the rights of the consumer. When the copyright holder does not provide access to the raw, unprotected, copyright material, the consumer is strictly limited in the use that may be made of that material. The author of a work of music should not require that you play the entire piece uninterrupted, however he may desire just such a restriction, and regardless of whether the distribution media he chooses has the technical capability of enforceing such a requirement. This example may seem contrived, in fact it only appears so because traditional technologies for music reproduction do not allow the either the manufacturer or the consumer much, if any, opportunities for manipulation of the music. The advent of digital technology opens many doors. For instance, I own a recording Handel's Water Music. Frankly, the orchastra plays it slightly too fast. I suspect in an effort to get it to fit on one CD. With a good sound editor, I can slow down the music (and retain the original pitch.) I would not be able to do this if I did not have access to the raw data stream. Visual media offers myrid possiblities. To contrive an example concerning video, I would enjoy writing software that repeats a scene of a movie, a pan over a landscape, with the sky digitially subtracted so that it can be projected onto a wall. This would (hopefully) acheive the illuison that the landscape forground is in front of the wall. As things stand, I'll never write such software. Not only do I not have access to the copyrighted data stream contained in any DVD I might buy, but niether does anybody else so there is absolutely no market for such software. Is such software possible. Without giving it a go myself, I'm not sure. But I see no real technical difficulties. After all, Fred Astair is now dancing with vacum cleaners on TV. Unless consumers have access to the raw data, we will never know whether such software is possible because no one will write such sofware. At least not until the movie industry, whatever that is, has spent 10 or 20 years "maturing" and gets around to it. Without access to the underlying data, the consumer's use of the material is entirely beholden to the copyright owner. The examples I've come up with in this paragraph may not be compelling. If I could

come up with examples compelling enough to make you grip your seat, I'd probably be rich. The point is, the consumer is cheated of opportunity lost; opportunity that he doesn't even know he has.

Perhaps you think cheated too harsh a word. The issue is whether or not, now that it is technically possible, copyright holders can license their work to consumers in such a fashion that the consumer's use of the copyrighted material is arbitrarily restricted. The consumer may only see the copyrighted image on a device (or operating system) made by a certain manufacturer, the consumer may choose when to begin the playback, but may only listen to the copyrighted song once, etc. The copyright holder cares not that the baby began to cry halfway through the playback. I don't believe that it is legitimate, once the consumer has paid the copyright holder, for the copyright holder to arbitrarily dictate the conditions under which the consumer may access the copyrighted materials. The consumer may only/never play the music on Sunday, the consumer may not stop the music once started, the consumer must not substitute the sound track to the movie. (I'm told that Pink Floyd's Dark Side of the Moon album is perfectly synched to the movie The Wizard of Oz. I've not firsthand experience, but I've spoken to people who claim they do. Sounds like the kind of thing Pink Floyd would do, dosen't it?) While this sort of nitpicky control over what the consumer may do with his work assuages the artists sensibilities, and the pockets of the companies that dole out licenses to material in tiny little bites, it does not feel right. It does not seem to "promote the progress of Science and Useful Arts." Historically, the author or inventor has given birth, and, upon payment, the material is released into the world for others to build upon, to present or use in unexpected ways, to be re-worked and re-interpreted. It is not hidden in a box to be taken out only in the lecture hall where the author can control all aspects of it's presentation.

As is usual in the digital world, you can't have it both ways. Either the copyright holder retains all rights over every last aspect of the material's use, or the purchaser of copyrighted materials can do anything, short of redistribution, with the materials purchased. Any other option is a fiction of law or a blindness in the collective consciousness. The nature of digital is all or none. Frankly, today it is a fiction that a copyright purchaser does not redistribute copyrighted material. It does seem clear that the combination of cracking down on illegal redistribution, and the willingness of people

to compensate the author of a work, is enough to ensure the authors are paid enough to get by. I point to the case of J. R. R. Tolken, an author who's work was distributed without authorization in this country. He published an authorized edition, and when people discovered the situation they willingly paid for the authorized edition rather than the unauthorized one. It is also clear that a author can make enough to get by even when there is no restriction on the copying of their work. The Grateful Dead music group is a well known example. They have always allowed their concerts to be recorded and the recordings to be re-distributed without restriction. They seemed to not only get by but prosper for many years. Of course, the present _distributors_ of copyrighted material stand to lose quite a bit should control transfer to the consumer with the sale of a copyrighted work. They will not be able to re-sell the same information in many different packages because the consumer will be able to repackage their data as they like it. Especially given the reduced cost of digital data distribution, there's no telling if the present distribution industry will be able to get by.

You might think that the preceding argument applies only to data recordings, digital records of still or moving images, sound, or whatever. Not true. Any computer scientist will tell you that there is no difference between program and data. For any picture/sound, you can write a program that will generate the picture/sound. For any program, you can have a big chunk of memory full of data that produces the same output the program would were the program given the same input. The input to the program is considered as an address in which the answer, the program's output, is stored. Look up the input, get the answer. Data is program and program is data. Examples of this swapping of data and program are rife in the computer manufacturing industry. A bit of program can be converted to a lookup table and stored in a ROM memory chip, or (less frequently) a lookup table in a chip can be converted to program code. So, a purchaser of computer software should have the same rights as that of a purchaser of a movie. Both should be able to obtain the plain, unscrambled, content of their purchase. Otherwise a copyright holder could translate his data into program and take rights away from the consumer.

Lest you think this an academic discussion, I'll point out that the PDF document you are reading (or at least the one I produced to send to the Copyright Office) is considered, by those who know such things, to be a program that is run by the PDF viewer. The output of the

program is the image you're reading. So this text is program, not data. I could be wrong on this, as I'm not a PDF expert, but I don't think so. Certainly the postscript commands your computer might send to your printer when printing this document are program, not data. Anyhow, you get the point.

Nor is it unimportant to be able to get to, and understand, the innards of bit of software. I point to the case of WordPerfect, the word processing software. Around the mid 80's WordPerfect Corp. lost their market lead to Microsoft Word when Microsoft introduced Windows, because they were not able to rapidly produce a Windows version of their product. They had licensed copies of Windows, but did not know the hidden system calls (software innards) that Microsoft used in their Word product. I cannot directly testify as to whether or how Microsoft used technical means to hide their secret system services, but I recall hearing that they tried to make it as difficult as possible to figure out how to use them. I believe it, Microsoft has since made a lot of money off Microsoft Word. This example also raises the question of what constitutes obfuscation, or, turned on it's head, what constitutes the "raw data" that I believe purchasers should have access to. The general notion of free access to purchased material should be clear, the details are an issue for further discussion.

A comment on the utility of the Digital Millennium Copyright Act:

subsection 1201(a)(1)(A) 'No person shall circumvent a technological measure that effectively controls access to a work protected under this title.'

This statement is so vague as to be meaningless. What constitutes an "effective" control. Nothing. A technology either works or it doesn't. We are talking about bits here, digital data, ones and zeros. There's no difference between one bit and another. It's not really any harder to change a million bits than it is to change one bit. If you need to circumvent a technological measure that controls access to a work, and the technological measure is digital, either you know the right way to flip the bits from 1 to 0 or you don't. If the technological measure is physical, then you can have varying degrees of difficulty manipulating the real world into a configuration that defeats the copy protection. Again, this is simply not true in the

digital world. Either you know how to do something or you don't. If you do know, you write a program, once, and forever after anybody who has that program can flip the bits. If you've told the world what you know, anyone who listens need only go through a certain amount of drudge work to translate your understanding into a program that works. (This is the difference between a programmer and a coder, a coder simply writes down, in a particularly tedious fashion, what others have figured out.) Copy protection based on encryption, scrambling, or whatever, is only effective until it's not effective any more. Some systems just take longer to break. Is an "effective" technology one that takes more than one month to break, more than one year, more than 10 years?

The situation seems to be that a copyright holder must simply declare that they have a copy protection scheme. Because people generally don't understand computers, it seems that the mere use of a digital copy protection scheme by the copyright owner gives the the impression the copyright owner has taken extensive measures to protect his work. In actual fact, most copy protection schemes are not complicated at all. It's as if a musician, seeking to protect his work, produces a old fashioned vinyl album that can only be played on turntables that turn at 20 revolutions per minute (RPM). This scheme would also allow the artist to put more music on his album than fits on the usual 33.3RPM album. The artist can then be sure that his work can only be accessed by those to whom he's sold a 20RPM turntable. So, as long as this artist claims that his copy protection method is to play his record at 20RPM, it would be illegal for anybody to make a 20RPM turntable, as that would circumvent the technological measure the artist has put in place to protect his work. His protection scheme would be effective too, at least until there were lots of 20RPM turntables available. Of course the net effect is to impede "the progress of Science and the Useful Arts", at least in so far as the development of long playing 20RPM turntables go.

You should note that a 20RPM turntable is a much more effective copy protection method than all but the best encryption. This is because, despite all the foofaraw about computers being tricky, it is much easier to write a program in your living room than to set up a machine shop and cut a bunch of gears. It is also much harder to distribute 20RPM turntables than it is to distribute a program.

It is if Congress had passed a law making unlicensed manufacture and

use of torex screwdrivers illegal. (You know, those newfangled screwdrivers with the star shaped head.) When introduced, torex screws seemed to be widely used by manufacturers who wished to keep people from peeking at the insides of the equipment they had purchased. These days, everybody with a mechanical inclination seems to have at least one torex screwdriver, but it still can be awkward to get your hands on the right one when you need it.

Regarding the effect of the prohibition of the circumvention of technological measures on scholarship and research:

The prohibition against the circumvention of technological measures, when considered strictly, has a chilling effect on scholarship and research in mathematics and computer science related to encryption technology. If it is illegal to develop ways to circumvent technological measures, then it is illegal to work in these areas. It's also darned difficult to develop good encryption methods without also developing good encryption cracking methods.

If it is illegal to distribute the means necessary to circumvent digital copyright protection methods, then it is illegal to communicate developments in the areas of encryption technologies. This is because these techniques are all math, and it's relatively trivial to turn a formal mathematical statement into a working computer program. This is exactly what compilers, the programs that translate what the programmer writes into what the machine runs, do.

Math is program. Program is math.

If it is illegal to possess the means to circumvent digital copyright protection methods then it is illegal to posses the tools necessary to research in mathematics and computer science. Encryption has made what was abstract mathematics applied math, although I don't know if they've changed the nameplates on mathematicians' doors yet.

If it is merely illegal to actually circumvent particular technological protection methods, then it is illegal to research the current state of the art. This prohibition is much more likely to affect the amateur, than the professional researcher. If cars came with their hoods welded shut and it was illegal for other than a licensed mechanic to break the seal, you'd see a lot of teenagers

getting busted, and not too many automotive engineers. You'd also see a dearth of automotive engineers. This would not promote progress in Science and the Useful Arts.

As written, it appears to me that the Digital Millennium Copyright Act allows a copyright owner to declare any digital technological trick to be a copy protection measure. Hence, the above arguments apply to all sorts of digital technology and there is a corresponding chilling effect on the development of all digital technology. I point to the case of Jon Johansen, one of a team of people attempting to develop a DVD player for Linux, who was recently arrested for his success in this area. Someone wishing to develop the "frame grabbing panoramic movie wall" application proposed above would could also be arrested on the same charges.

A note to the Copyright Office on the required format for submitting comments:

I would like to congratulate you on your decision to accept comments in plain ASCII text. However, your requirement that all comments be submitted as attachments is an unnecessary, and in some cases burdensome, restriction. It is unnecessary because the standard format for e-mail, as specified in RFC822, is plain ASCII text. That's what you get when you receive a plain old e-mail. It is burdensome because not all e-mail programs will generate mime attachments. There are many people who have no need of mime attachments and do not use an e-mail program which supports them. For example, the last time I noticed, the entire student body of the University of Chicago is trained to use an e-mail program that does not support mime attachments.

In closing, yes, I will consider testifying before Congress if asked to do so.

Very Truly Yours,
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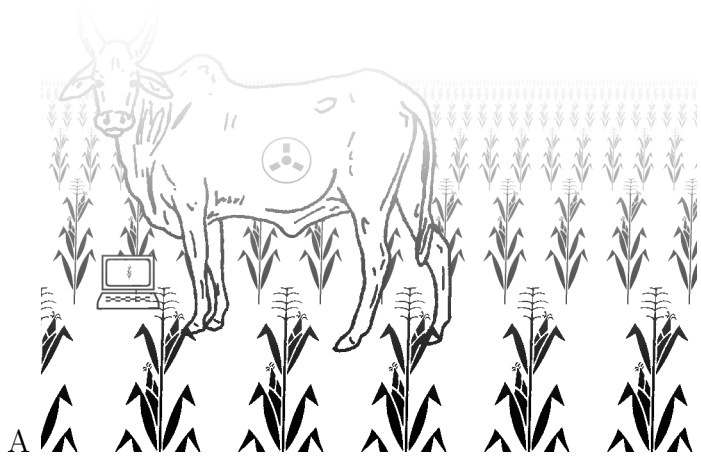

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