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THE ANALOG HOLE: CAN CONGRESS PROTECT COPYRIGHT AND PROMOTE INNOVATION?

HEARING

BEFORE THE

COMMITTEE ON THE JUDICIARY
UNITED STATES SENATE

ONE HUNDRED NINTH CONGRESS

SECOND SESSION

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WEDNESDAY, JUNE 21, 2006

U.S. SENATE,
COMMITTEE ON THE JUDICIARY,
Washington, DC.

The Committee met, pursuant to notice, at 9:34 a.m., in room SD–226, Dirksen Senate Office Building, Hon. Arlen Specter, Chairman of the Committee, presiding.

Present: Senators Specter, Hatch, and Leahy.

OPENING STATEMENT OF HON. ARLEN SPECTER, A U.S. SENATOR FROM THE STATE OF PENNSYLVANIA

Chairman SPECTER. Good morning, ladies and gentlemen. Now that our witnesses are all here, we will proceed. We had heard there was a traffic problem in Washington. Shocking development that that would occur to delay witnesses, but we are all here now so we will proceed with this hearing on the inherent tension between protecting copyrights and stimulating technology.

This is the third hearing conducted by the Committee on this issue. Last April, we had a hearing on the digital radio issue, in September on Grokster, and today's is the third hearing. We will take up the question of the so-called analog hole, which is the technological loophole that could allow intellectual property thieves to illegally duplicate digitally protected movies, video programming, and other visual creations that are viewed in the home.

Content owners have incorporated anti-copying features, but they are not foolproof. So the object is to see to it that we can protect property rights and we can also do without curtailing innovative ideas in a very fast-moving field.

I hosted a roundtable earlier this month on June 6th with the interested parties to see if we could find some area of compromise. When you deal in an issue of this sort with giants on both sides, my experience has been that it is preferable to see if the parties cannot find a solution among themselves as opposed to relying on Congress. Legislation is full of unintended consequences. It does not have too many intended consequences. So that if it can be worked out to the satisfaction of the people who are interested and know the most about it, that is the preferable course.

Without objection, my full statement will be made a part of the record.

[The prepared statement of Chairman Specter appears as a submission for the record.]

Chairman SPECTER. Let me yield now to my distinguished colleague, Senator Hatch, for an opening statement.

STATEMENT OF HON. ORRIN G. HATCH, A U.S. SENATOR FROM THE STATE OF UTAH

Senator HATCH. Well, we are just happy to have all of you here. I am more interested in listening to you and seeing what you feel about these matters. Of course, we want to do what is right, and I appreciate the Chairman holding this hearing. I appreciate his leadership in this matter, and I appreciate all of you for being here.

That is all I have to say. I am going to listen as carefully as I can. Thanks, Mr. Chairman.

Chairman SPECTER. Thank you very much, Senator Hatch.

Our first witness is Mr. LeVar Burton, a National Board Member of the Directors Guild of America; well-known for his performance in the role of Lieutenant Commander Geordi La Forge in the television series "Star Trek;" also a director on such television programs as "Charmed," "JAG," "Star Trek;" a graduate of the University of California School of Theater. Thank you very much for joining us, Mr. Burton, and we look forward to your testimony.

As you note from the time clock, we have a 5-minute rule, and we will start the clock back at 5.

STATEMENT OF LEVAR BURTON, NATIONAL BOARD MEMBER, DIRECTORS GUILD OF AMERICA, LOS ANGELES, CALIFORNIA

Mr. BURTON. I will get right to it then.

Chairman SPECTER. Thank you.

Mr. BURTON. Thank you, Mr. Chairman, Senator Hatch, very much for the invitation to discuss this problem posed by the technology gap that you referred to earlier as the "analog hole."

As you stated, I am here today on behalf of the Directors Guild of America, and I am a National Board Member, and the Directors Guild today represents over 13,500 directors and members of the directorial team who work in feature film, television, commercials, documentaries, and news. The DGA's mission is to protect the economic and creative rights of directors and the directorial team, and we are working to advance our artistic freedom and to ensure fair compensation for our work.

Now, during the making of a film, directors are actually running a multi-million-dollar business—a business involving hundreds of people and a myriad of details and decisions that have to be made each day to keep the production on schedule and on budget. Whether it is the crafting of a single scene or the visual creation of a character from the written page, the director is always working to tell the story. That is what we do. This is not an effort we take lightly, and it is not uncommon for a director to put years of work into a single production.

We want you to know that the DGA places the highest priority on the prevention of widespread pirating of movies, television programs, and other creative works. And, indeed, the entire film production industry—from studios to independent production companies, directors, writers, actors, and the tens of thousands of below-

the-line workers, both skilled and unskilled—has a tremendous stake in the ever-growing problem of piracy.

Now, when the film industry is mentioned, what first and foremost comes to people's minds is generally the popular image of glitz and glamour and the wealth of Hollywood. But like that proverbial iceberg, that is just a small part of the picture.

Yes, our industry is concentrated in Los Angeles and New York, but, in fact, the film industry exists in every State in the country. And, yes, there are some luminaries known the world over who are fabulously wealthy. But, in fact, most directors and others who work in our industry are very much unknown to the public. We work behind the camera, and the overwhelming majority of jobs in our industry are held by what we call "below-the-line workers"—the people whose names scroll by at the conclusion of a film. These are the set designers, the carpenters, sound technicians, painters, drivers, lighting technicians, make-up artists, seamstresses, and so many other jobs, often amounting to hundreds of hours of work on a film. And they are no different than workers in other industries whose jobs are understandably important to you Members of Congress.

And those are just the employees of the production company. The filming of a movie and a TV program also generates substantial employment for scores of small businesses that provide supporting services and equipment for the filming of a movie, from highly skilled computer technicians and artists at special effects companies, to caterers, dry cleaners, security personnel, and others who work for the companies that support film production.

For directors, writers, actors, and the many craftspeople we work with, film and television production involves years of creative effort and hard work to put a vision on the screen. For the studios and the investors, it involves tens, if not hundreds, of millions of dollars to make that vision a reality. Today, the average studio film costs, believe or not, nearly $100 million to make and market.

Obviously, this involves a high risk for almost everyone involved, and it means that it is never easy to get a film financed—a reality faced by every one of us who is in this business. I want you to consider that many films do not actually retrieve their investment from theatrical distribution.

Most films made for theatrical release require large capital investments, and these are highly risky investments since their return cannot be known at the outset. Yet today, theatrical receipts account for less than 30 percent of the income received from studio films, and that means that sales in ancillary markets—from DVDs to pay and free television, which are most at risk from unauthorized copying—are critical if films are to recoup their investments. Quite simply, without the revenue from these ancillary sales, pictures would just not get made today.

Clearly, the willingness and capacity of producers to invest in film and digital television is undermined when our creative works are illegally copied, whether in analog or digital form, by casual users or mass-produced production facilities, over the Internet, or by hard disk. When a greater share of potential income is siphoned off—stolen as a result of piracy—risk rises, financing becomes more

difficult, we are not able to make our films, and American jobs are lost. That is the bottom line.

For directors and for the DGA, this is the fundamental concern with piracy: that the siphoning off of revenue from ancillary markets will result in fewer films being made, which means less opportunity for us, as creators, to make the films and television shows for the American public.

I see that my time is ticking away. There is more I would love to say.

Chairman SPECTER. It is not ticking away. It is up.

Mr. BURTON. It is up.

[Laughter.]

Chairman SPECTER. But if you have another thought to express, go ahead, Mr. Burton, and summarize.

Mr. BURTON. Well, just to summarize, Senator, obviously there are people in Hollywood who make a lot of money doing this, and there are many concerns that are expressed by both sides of this equation. We at the DGA want this Committee to know that we represent hundreds and thousands of working people who are doing their jobs every day, raising their families, and that the issue of piracy is one that is of great concern to us. And whatever help you can give on this issue, we are most appreciative, and thank you for your leadership on this problem. And good morning, Senator Leahy.

Senator LEAHY. Good morning.

[The prepared statement of Mr. Burton appears as a submission for the record.]

Chairman SPECTER. Thank you very much, Mr. Burton, and I now yield to our distinguished Ranking Member, Senator Leahy.

STATEMENT OF HON. PATRICK J. LEAHY, A U.S. SENATOR FROM THE STATE OF VERMONT

Senator LEAHY. Thank you, Mr. Chairman, and, Mr. Burton, thank you. I have read your testimony, I am glad I got in for this hearing, and it is good to see you again.

Mr. BURTON. It is good to see you, too, Senator.

Senator LEAHY. I was actually at a breakfast, Mr. Chairman, where this was the major discussion, and it went on a lot longer than I thought it was going to. That is why I am delayed.

I am also glad to see Mr. Zinn, who is in the same class as my eldest son at UVM. We treat everybody fairly by mentioning he was with my eldest son at the University of Vermont.

The so-called analog hole is a major issue, and content owners are concerned over this gap in copy protection of their digital works. The analog hole, as others will describe, opens up when digital input is converted into an unprotected analog form so it can be viewed clearly on the millions of analog TV sets in households across the country. It is something that people our age may not well understand, but our 12-year-old neighbors could very easily understand. That analog content, as Mr. Glickman knows, could then be reconverted into unprotected digital form and put on the Internet. And, of course, once it falls into that hole, it has lost all digital protection.

The possibility that this digital-to-analog-back-to-digital transformation could facilitate indiscriminate redistribution of copyrighted video content is real. As we have learned from past experiences—the unfettered illegal sharing of content over peer-to-peer networks that cost the copyright industries millions of dollars—there are many reasons to work hard to end the infringement of copyrighted goods. The theft of goods—Mr. Burton mentioned the number of people employed who lose jobs, but also Congress just has an overall obligation to help ensure that copyrighted materials are protected.

But the balance I have always had trouble with is this: I do not yield to anybody in my concern about copyright matters. Senator Hatch and I have worked over the years many, many times on this issue, as have Senator Specter and I. If somebody has got a copyrighted material and they have worked hard and they have done it, they ought to be able to profit by it. If nobody likes it, if nobody wants to buy it, that is fine. Then they do not make anything. On the other hand, if somebody really likes it, they ought to get compensated for that. Your business models may have to change in how you do things. None of you are going to be investing huge amounts of money into brick-and-mortar stores to sell your product. But you are going to be investing a lot in trying to sell them in other ways.

I worry that technology invariably moves faster than legislation, and many times you are far better equipped to know what is going to work and what consumers will buy. The inexpert hand of Government is not as effective as the relevant markets in moving assets and interests to their best uses.

So we are trying to find the best thing. I think it is clear that we have to make sure that a copyright is a copyright. But we also have to make sure that we do not put a heavy Government brake on technology. We were asked to do that once years ago, I remember, on this Committee when the first VCRs were coming out, and we were afraid people might copy a movie off television. And we were told that a lot of the movie companies wanted to be able to sell their movies at $125 a copy. I said, "Well, why don't you sell them at $10 a copy or $15?" Now everybody knows, Mr. Glickman and others know that with every movie made, you have to think of what is the after-sale on DVD.

So let's find the best way, but also let's find the best way if somebody has a copyrighted material, it ought to mean that not only here, but my last point would be for those who may be listening, whoever is in the administration has got to do a tougher and better job around the world in getting other countries to respect this. You cannot have China just do a photo op when they are trying to get the Olympics in Beijing, a photo op of crushing pirated material, when out back of the same building they are selling five times more than they just destroyed.

So, Mr. Chairman, this is very timely and I applaud you for having the hearing, and seeing my friend Senator Hatch here, he and I have sat through an awful lot of these hearings in the past.

Chairman SPECTER. Thank you very much, Senator Leahy.

We turn now to our second witness, Mr. Dan Glickman, Chairman and CEO of the Motion Picture Association of America; had

been President Clinton's Secretary of Agriculture; 18 years in the House of Representatives; bachelor's degree from Michigan and a law degree from George Washington University. On his official resume, I do not see his most important attribute. He was born in Wichita, Kansas.

Mr. Glickman, we are delighted to have you here. I might add by way of an addendum, at least in my view the most important attribute, I was also born in Wichita.

Mr. Glickman. I heard that before I came to this hearing today.

Chairman SPECTER. I left in 1942 to make room for Dan Glickman, who arrived in 1944.

[Laughter.]

Senator LEAHY. And, Mr. Chairman, if I might—

Chairman SPECTER. But I left on Highway 96, and he arrived at the Wesley Hospital.

Senator LEAHY. You do do backgrounds on these guys.

[Laughter.]

Senator LEAHY. I might also mention that my youngest son is this week in Wichita in flight training. I mean, we get this—anyway.

Chairman SPECTER. Senator Hatch, what do you have to say about Wichita?

[Laughter.]

Senator HATCH. I look at this bunch of characters and they leave me dumbfounded, I tell you.

STATEMENT OF DAN GLICKMAN, CHAIRMAN AND CHIEF EXECUTIVE OFFICER, MOTION PICTURE ASSOCIATION OF AMERICA, WASHINGTON, D.C.

Mr. GLICKMAN. Well, we citizens of Wichita appreciate it, Senator, and thank you all for having this hearing. And I want to thank you for the opportunity to talk about the analog hole, which is a fairly obscure term, but, frankly, an avenue for massive infringement of copyrighted material protected under the law. We have a hole here that has the potential of massive leakage of copyrighted material. So the question is how we deal with this particular problem.

My friend LeVar has talked a little bit about the impact on the copyrighted industries. The film industry has a positive balance of trade with virtually every country in the world. It is an enormous job creator. However, the viability of this creative output is reliant upon our ability to protect it from being devalued by theft, and this is where the problem occurs. We are in the digital future, as Senator Leahy talked about. That will allow viewers to watch virtually any movie at any time, at any place, at prices dictated by a competitive and thriving marketplace.

In my statement, I talk about our studios and our companies are expanding their distribution channels to harness new technologies to deliver content in a variety of ways. I have listed Disney, Warner Brothers, NBC Universal, MTV Networks, Fox, and every one of our companies and others are taking advantage of this digital marketplace right now by offering all sorts of options.

However, while the industry embraces the many opportunities of the future, it must deal with the ever present threat of theft.

The pilfering of our films costs our industry approximately $6.1 billion a year. Noncommercial copying of movies for family and friends, which is a large part of what we are talking about here today, costs our members an estimated $1 to $1.5 billion each year. On the Internet front, it has been estimated that as much as two-thirds of Internet bandwidth in this country is consumed by peer-to-peer traffic, much of which is attributable to movie theft.

We are embracing digital rights management technologies so that we can offer consumers more choices at greater varieties of price points. People may want to purchase a permanent copy of a movie. Others may want to only watch it once and do it at a lower price. However, to maintain that distinction, we need to provide technical safeguards to ensure that the consumer who opts to take advantage of a time-limited viewing option at one price is not, in fact, getting the benefit of the sale option. Otherwise, the price of the time-limited model will naturally migrate toward the sale model, all of which is to the detriment of the honest consumer.

In the DVD area, we have done this, and we have developed copy control mechanisms to ensure that, in fact, that content is protected. But there are some areas where private sector solutions have not worked. The analog hole is an example of an area where assistance is needed.

When digital content protected by digital rights management technology is converted to analog form for viewing on legacy analog television equipment—that is, existing TVs, for the most part—the content is stripped of all its digital protections. This analog content then can be redigitized "in the clear," without any protections whatsoever. The redigitized and completely unprotected content can then be efficiently compressed, copies, and redistributed without degradation. It can also readily be uploaded to the Internet for unauthorized copying and redistribution. Like a black hole, the analog hole sucks in all content protections, leading to various problems—leading to the opportunity for massive copyright infringement of protected items.

This is not an idle concern. Some manufacturers voluntarily design analog-to-digital conversion devices to respond to analog copy protection information, such as one called CGMS–A, other markets devices specifically designed to exploit the analog hole. I have one here. We will leave it with the Committee so you can take a look at it. This stripper is one example of a device specifically designed and marketed to take advantage of the analog hole. These bad actors are reaping a windfall at the expense of motion picture companies and ultimately consumers, and good actors are placed at a competitive disadvantage.

Closing the analog hole would place analog-to-digital conversion devices on an equal footing with all digital devices by maintaining the integrity of digital rights management measures. My testimony talks about the bipartisan solution in the House sponsored by Congressmen Sensenbrenner and Conyers known as "CGMS–A plus VEIL." It provides a practical degree of protection. It has been the subject of intense scrutiny by technology and content communities, as well as other interested parties, and there is a broad consensus on the nature of the selections that should be considered. Indeed, three major technology companies, I think all members, if I am not

mistaken, of Mr. Shapiro's organization—IBM, Thomson, and Toshiba—have publicly endorsed the CGMS–A plus VEIL technical solution.

So I appreciate the fact of coming here. I want to restate the problem again. Because of this hole, we have an avenue for massive copyright infringement which will negate the economic value and basis of the production of movies and other video content which will hurt not only Mr. Burton's clients and people he represents, but everybody in this industry.

We look forward to working with you, as well as our colleagues here at this table, to find an appropriate solution, but we think that the legislative solution is warranted. And thank you very much, Mr. Chairman.

[The prepared statement of Mr. Glickman appears as a submission for the record.]

Chairman SPECTER. Thank you very much, Mr. Glickman.

Our next witness is Mr. Gary Shapiro, President and CEO of the Consumer Electronics Association, also Chairman of the Home Recording Rights Coalition; was an assistant to Congressman Mickey Edwards; Phi Beta Kappa graduate from State University of New York, a double major—economics and psychology; and a law degree from Georgetown.

We welcome you here, Mr. Shapiro, and the floor is yours.

STATEMENT OF GARY J. SHAPIRO, PRESIDENT AND CHIEF EXECUTIVE OFFICER, CONSUMER ELECTRONICS ASSOCIATION, WASHINGTON, D.C.

Mr. SHAPIRO. Thank you for this opportunity to testify on the so-called analog hole. We understand the movie industry is concerned about what consumers may do with content that they have absolutely lawfully acquired. This concern has led to yet one more request to Congress to expand copyright law and even to dictate how products can be designed and used. We believe that this most recent request is a bad solution in search of a problem, and we ask you to consider that every time that Congress accedes to the content community request, someone else is paying the price, whether in terms of higher prices, unavailable products and features, or even higher litigation costs. Indeed, the historic vast expansion of copyright law these last few years was supposed to end with the inducement language of the Supreme Court, but that case appears to be just the beginning. The content community is aggressively pushing new legislation that would impose new design mandates on our products, and the analog hole mandate is just one of those proposals.

Mr. Chairman, in your opening statement, you referred to intellectual property thieves, and I just heard my two colleagues talk about piracy and thieves and theft. But yet, as Mr. Cookson points out in his written statement, the analog hole mandate does not even address piracy. This is what he says: "These technologies are not intended to resist determined commercial pirates. They are designed to provide normal consumers with a way to determine that they are crossing the line."

This is determined to frustrate consumers doing what they are supposed to be able to be doing in their home, which is shifting

content around. Yet these technologies that they are advocating are complex, untested, and would cripple millions of consumer products and would have huge implications on many non-consumer technologies.

Let me tell you how the Hollywood community views this proposal. The industry magazine called Variety recently ran a story headlined, "Biz Balks as MPAA Digs Hole for Itself." The sub-head says, "Analog problem requires complex copyright protection scheme." The story describes how a motion picture industry audience responded with "dubious groans" when the MPAA's own top engineer described this so-called solution and that he expected it would be retailers who would be the ones who would have to explain it to disenfranchised consumers. The article states, "The final question summed up the problem. This is a roomful of people whose living depends on this working. You are getting pushback to the point of hostility. If you can't sell it to us, how are you going to sell it to the target 16 to 45 demographic?"

Yet the MPAA is pushing this complex, Rube Goldberg proposal which will distort devices to get at some theoretical harm. Where is the proof of harm? Where is the need for legislation? Indeed, there is no evidence at all that the analog hole is contributing to any motion picture industry problems. Don't believe me. Look at the evidence. MPAA's own website states that 90 percent of pirated copies come from handheld camcorders. And an independent AT&T study found that 77 percent of movies on P2P networks were leaked by movie industry insiders. Which ever of these studies is correct, it does not have to do with the analog hole.

And even if there were some real harm, the only proposal we have seen on this, H.R. 4569, is so broad and so unfocused that it would eliminate real products that served needs and hurt no one, like the great Slingbox, which I could talk more about later.

In fact, this bill, the legislation, starts with the premise that the thing to be protected is something called "a covered format." MPAA, in its inter-industry discussions, has had 10 years to figure out what the video resolution of such a format would be and to define it and how many semiconductor components and pieces of software would be covered. They have not. They want under this legislation to leave it to the Patent and Trademark Office after Congress has decided that a mandate should be put in place.

This fundamental drafting hole suggests one of two things: either they are afraid to admit the breadth of the hardware and software to be covered, or the technology is changing so rapidly that they are afraid to put a definition in the bill.

One key concern is there are two required copyright protection technologies. One is VEIL. Its cost and operation are unknown. You cannot even assess the VEIL technology unless you pay a $10,000 fee and promise not to talk about it. So how can Congress mandate a technology which is incapable of being discussed and reviewed? How can we even comment on it? But I do trust our member, Texas Instruments. They oppose this proposal and point out in documents attached to my written testimony that the VEIL own documents indicate the VRAM watermark does not work 42 percent of the time, and it actually caused a noticeable difference in 29 percent of the test clips. Asking Congress to mandate a secret

technology which may affect visual performance and illegitimize many products is really quite an ask.

Another unanswered question is VEIL's licensing status. I would like to conclude with this: Other countries are busy developing their technology industries to compete with ours, but we are here facing and fighting proposals and a massive amount of litigation which is bankrupting some of my own members under existing laws which suppress new technologies simply to preserve old business models. We have prospered recently as a country because of these same technologies. We are a nation of individual creators, and our creativity cannot and should not be solely defined by a handful of large companies. There are all sorts of things from the Internet—mixing technology, blogging, mashing, and home video editing—which have made millions of Americans creators and fostered websites like iTunes, YouTube, and others. If you want to block the hole, the analog hole, we are also blocking Americans from exercising their fair use rights and sampling—

Chairman SPECTER. Mr. Shapiro, how much more time will you need?

Mr. SHAPIRO. One minute. There is a new breed of Americans which are your constituents, and they are our consumers. They like to TiVo, timeshift, playshift, and manage their content, and I can't imagine they want the law changed to deny this right.

Thank you for this opportunity. We want to work with you to continue this historic digital revolution and our Nation's leadership in content creation, entrepreneurship, and creativity.

Thank you.

[The prepared statement of Mr. Shapiro appears as a submission for the record.]

Chairman SPECTER. Thank you, Mr. Shapiro.

Our next witness is Mr. Chris Cookson, Chief Technology Officer and President of the Technical Operations at Warner Brothers; previously had been Vice President and General Manager of the Operations and Engineering Division of CBS, 10 years at ABC; undergraduate degree and an MBA from Arizona State University.

Thank you for coming in today, Mr. Cookson, and we look forward to your testimony.

STATEMENT OF CHRIS COOKSON, PRESIDENT OF TECHNICAL OPERATIONS AND CHIEF TECHNOLOGY OFFICER, WARNER BROTHERS ENTERTAINMENT INC., BURBANK, CALIFORNIA

Mr. COOKSON. Thank you, sir. Chairman Specter, Ranking Member Leahy, thank you for inviting me to testify today. In 2002, Richard Parsons, our Chairman at Time Warner, testified before this Committee and identified that the analog hole was one of the challenges facing the audiovisual industry in its transition from the analog world to the digital world that could not be addressed purely in the marketplace but would require, in fact, some kind of Government intervention. Today, I would like to focus on three aspects of this issue: enabling consumer choice, respect for copyright, and the fact that this is a transitional issue that gets us from where we have been to where we are going.

We are in transition from an analog world where we used to live to a digital world which faces us in the future. The analog world

had order and structure that delineated the choices we had. For instance you could go and rent a VHS or you could buy a VHS. If you did not take it back, you knew you were going to pay more than if you just rented it.

Unauthorized copies in that world degraded badly, and none of us really had the capability of transmitting content to other people.

A fully digital world will also allow for this distinction between consumer choices. Technologies like encryption can be used to authorize access based on how a consumer wants to use content and the terms under which it is offered. For example, in the digital world you can choose to watch once. You can choose to have a copy to watch for a week. You could choose to keep a copy in a library and so on. The choices actually in the digital world can be unlimited. But the key thing is the consumer can decide which uses they want to make.

The digital world also allows for unsecured content to be copied and transmitted quickly, inexpensively, easily, and endlessly, and with no loss of quality.

Today, we are in the middle of that transition where content is delivered predominantly to our homes in digital form, and the problem is we mostly still have old analog TVs. And so the digital content that comes to us in digital form with rights management associated with it has to be descrambled and put into an analog form to get the last 3 feet from the top of the set to the back of the set. When that happens, all the protections are lost and the content can be easily redigitized, resulting in nearly perfect files, which can then be copied endlessly and retransmitted.

Consumers need and deserve a clear understanding of the terms of an offer that they can accept and the bounds of the functionalities that they will receive. We expect that most consumers will respect copyrights when the offer is perceived as fair, when the offer is understandable and easy to use, when the quality of service meets their needs, and the outlines of what the agreed uses are are clear. A clear understanding when the attempted use crosses the lines then helps to make a better definition of the offer, and the consumer then understanding what they got.

Our job is to figure out how to make appealing, fair, understandable choices available to consumers, and we are trying hard. Today, the products which analog inputs, such as some we have brought today, make it more difficult for consumers actually to understand what the deal is. If I can put a copy in my library when I take the offer that said view once and it is easy and it is done with things I bought in a regular on an open market, am I foolish if I pay the price to buy it to put into my library? And if the price for Pay-Per-View includes the ability to put it in my library, can I really get a cheaper price if I really say I really want to watch it only once? Or do we all have to pay the same price no matter what use we want to make?

The misapprehensions of this approach that Mr. Shapiro mentioned actually come from, I think, a lot of misunderstanding and some bad information about what is included. I would be glad to go into more detail about what is included, but there is no implication here for F–16s, as I have seen said, or for toasters or for other devices. We are focusing narrowly and only on those devices which

a consumer would buy that have the ability to digitize analog. And those devices and only those devices are involved.

It will not eliminate my TiVo. I have several TiVos. I like my TiVos. They are fed directly from digital satellite. Most personal recorders in the TiVo class are fed directly by digital satellite or cable, and they are already subject to the kinds of controls we are suggesting that the analog hole measures would induce.

The advantage of this approach is that it is very narrowly focused. It deals only with those devices which have the capability to digitize analog. Other people have suggested the answer is just banish analog outputs. We think that that is a flawed approach because it ends up hurting those who can least afford it. The people who have analog TV sets should be able to expect to receive a service life of those TV sets which they were designed to give when they were new.

Thank you very much.

[The prepared statement of Mr. Cookson appears as a submission for the record.]

Chairman SPECTER. Thank you, Mr. Cookson.

Our next witness is Mr. Matt Zinn, Vice President, General Counsel, and Chief Privacy Officer of TiVo Incorporated; previously had been a senior attorney of broadband law and policy for Media One; also had been corporate counsel for Continental Cablevision; bachelor's degree from the University of Vermont and a law degree from George Washington University.

A thumbs up from Senator Leahy, Mr. Zinn, and we look forward to your testimony.

Senator LEAHY. And classmate of my son.

[Laughter.]

STATEMENT OF MATTHEW ZINN, VICE PRESIDENT, GENERAL COUNSEL, AND CHIEF PRIVACY OFFICER, TIVO INC., ALVISO, CALIFORNIA

Mr. ZINN. Chairman Specter, Ranking Member Leahy, and Senator Hatch, thank you very much for the opportunity to present TiVo's concerns about this proposed legislation that we believe would inhibit innovation and have profound consequences for consumers' expectations as to how they can use lawfully acquired content. TiVo is a 400-person Silicon Valley company that makes products that allow consumers to have flexible use of lawfully acquired content such that they can watch what they want to watch, when they want to watch it, and where they want to watch it.

We are very concerned about piracy. We think that is a laudable goal, and we take a lot of steps to make sure that content does not get pirated by using strong encryption. However, we are also very sensitive to the needs of consumers who want to have flexibility to make use of content for their own personal noncommercial uses, such as in the home.

I am not sure what the problem is here because nobody has talked about an analog hole problem. Mr. Burton has talked about piracy, but there is no linkage between his testimony and the analog hole. Mr. Glickman has talked about the potential for massive infringement through the analog hole, yet nobody has demonstrated a dime of lost revenue due to the analog hole. So, you

know, we need to identify what we are talking about here. Is it piracy? Is it indiscriminate redistribution of content over the Internet? We need to identify what the problem is.

If it is piracy, analog to digital conversion is not what pirates use to copy DVDs and pirate content. They use digital-to-digital conversion tools, such as the types of things that are discussed in Maximum PC magazine for this month. And if pirates were to even use the analog hole, then the combination of CGMS–A and VEIL would not stop a pirate. They are very easy to defeat by people who are determined to defeat those tools. So the only people who are affected by this legislation are ordinary, honest, law-abiding consumers who will have their rights stripped away so that Mr. Cookson can make more money by charging every time you play a show. Basically, Mr. Cookson is trying to remove the "L" from the "Play" button and make it a "Pay" button. Every time you watch something, you have got to pay.

Now, the legislation mandates that we use a technology called VEIL, which is an untested technology, as Mr. Shapiro has said, and it is a technology that has been hand-picked by the studios. It seems crazy to me that Congress would mandate that consumer electronics companies have to use a technology that has not been vetted by the companies that would have to use it. And VEIL presents us from a patent perspective with a massive problem. I have to use a certain technology mandated in a certain way, and I have got no protection if I get sued for patent infringement. You only have to look at the BlackBerry settlement of a couple of months ago for $612 million to understand the kind of damages I am talking about here for using technology that I did not even ask to use. So that kind of exposure should be reason enough to question this kind of legislation, but that is not all. We have criminal and statutory penalties of $2,500 per device just to comply with the robustness rules, and the robustness rules require us to protect against hackers using ordinary tools.

Now, I do not think consumer electronics companies can make a device that could withstand hackers. Hackers can pretty much hack any device today, and so this legislation would put me in jeopardy of Draconian penalties from day one because I cannot build a device that can withstand hackers.

So at the end, I feel that this legislation is really not about piracy. It is about exerting control over consumers' uses of lawfully acquired content, and the types of things that would be prevented by this legislation would be I could not move a show from the living room to the bedroom if I get tired and I want to watch a show in the bedroom. Pat Reilly could not make a DVD of Dwyane Wade's latest moves in the last game so that he can watch the next game when he is on a plane. And I could not, you know, transfer a copy of "The Crocodile Hunter" from the Discovery Channel to my laptop so I can watch it at a place more convenient.

I am not a pirate, and these are not piracy. The MPAA may think they are piracy, but these are fair uses. And I see no reason to change the balance of copyright law to prohibit these uses just so that the content industry can make more money for people watching content that they have already paid to watch.

So, in summary, the analog hole is not the problem. We believe in protecting content from piracy, but this is not the problem. This is a solution in search of a problem. Copy controls on legitimate consumer use are different than piracy prevention. These are two different things we are talking about, and manufacturers should not have to bear the burdens and the liabilities, and consumers should not have their freedoms restricted for a problem that has not even been really vetted. So we urge the Congress and this Committee to take a hands-off approach to the analog hole and to let the affected industries deal with this problem.

[The prepared statement of Mr. Zinn appears as a submission for the record.]

Chairman SPECTER. Thank you very much, Mr. Zinn.

Our final witness is Ms. Gigi Sohn, President and co-founder of Public Knowledge, an intellectual property and technology public interest group; previously served as project analyst at the Ford Foundation's Media, Art, and Culture Unit; also was Executive Director of Media Access Project; summa cum laude graduate from Boston University with a degree in broadcasting and film, and a law degree from the University of Pennsylvania.

Thank you very much for joining us today, Ms. Sohn, and the floor is yours.

STATEMENT OF GIGI B. SOHN, PRESIDENT, PUBLIC KNOWLEDGE, WASHINGTON, D.C.

Ms. SOHN. Thank you, Mr. Chairman, Ranking Member Leahy, and Senator Hatch. Thank you for inviting me to testify today.

I want to focus on the impact of efforts to close the analog hole on consumers, so I bought a couple of props to help. Here is a video iPod. It is one of the most advanced personal digital devices available, but it has an analog connector right here on the underside. With a $20 analog cable, you could connect this to your television and watch your legally downloaded videos on your analog TV.

Here is a DVD player, also equipped with analog connectors on the back. These multicolored video and audio outputs allow you to watch your legally purchased DVDs on your television. You have probably seen similar outputs on the back of your VCR, TV, digital video camera, TiVo, or video game consoles. These analog outputs are the analog holes that the content industry wants you to close.

What would closing the analog hole mean for consumers? For one, it would restrict lawful uses of technology, like recording television shows onto a computer or moving recorded content from one device to another over a home network. These uses may not be authorized by the content industry, but they are 100 percent legal.

Second, closing the analog hole could make obsolete hundreds of millions of consumer devices. Devices that are purchased before an analog hole mandate goes into effect may not work with devices purchased after. There is no transition period and no backward compatibility.

Third, to the extent that such a mandate results in costs to device manufacturers, they will inevitably be passed on to the consumer.

Fourth, closing the analog hole will restrict, if not eliminate, the making of fair-use excerpts of DVDs or other digital media for

blogs, videos, or classroom use. This is because the DMCA makes it illegal to circumvent digital access controls for any reason, even if that use would be lawful under fair use.

The analog hole is an important legal and technical solution to this problem. Indeed, both the Copyright Office and the MPAA have said that the analog hole should be the only way for consumers to be able to engage in fair use of protected digital media. By now asking Congress to close the analog hole, the content industry is playing a shell game that consumers will lose.

Now, let me just say, for Mr. Cookson, I think consumers are smarter and they know what the limits of copyright are. But, in any event, those are limits that the law should set, not that Time Warner or Fox or Disney should set. The legislation introduced in the House would codify these consumer harms. I get into detail in my written testimony, but let me just say for those of you who have been involved in patent reform, this would impose duties on an inexperienced and overworked Patent and Trademark Office in an area where they have really no expertise and put them in charge of oversight of a vast number of consumer electronics and computer devices.

I note that Hollywood has offered no real evidence that analog-to-digital conversion is being used for indiscriminate redistribution of copyrighted works. Indeed, much of the testimony submitted to you today focused on hard goods piracy and infringement resulting from the use of computers and digital networks. The way to fight these problems is not by removing an important means for consumers to lawfully use the digital media and technology they purchase. Instead, the content industry should use the many legal, technical, and marketplace tools at their disposal, including the Supreme Court's *Grokster* decision, which allows content owners to sue manufacturers and distributors of content who actively encourage illegal activity. This directly addresses Mr. Cookson's concern that some analog to digital device manufacturers encourage infringement.

The Family Entertainment and Copyright Act, which makes it illegal to bring a camcorder into a theater or leak pre-release movies; lawsuits against individuals who engage in wholesale infringement over peer-to-peer networks; agreements between content companies and Internet service providers to crack down on piracy while protecting individual privacy; and digital rights management tools that are marketplace driven, not Government mandated.

Of course, the best deterrent to widespread infringement are business models for online content delivery that are reasonably priced, easy to use, and flexible. To Hollywood's credit, it is starting to experiment with different business models. We believe that Congress should allow the market to work before it adopts a technology mandate that, on balance, will hurt consumers far more than it would help the industry.

I would like to close with this thought. When Congress was considering the DMCA 8 years ago, the content industry assured legislators that this would be the last law that they would seek to limit consumers' lawful uses of digital media. But in that time, we have seen proposed law after proposed law intended to further limit consumer rights and which impose a variety of innovation taxes on the

technology sector. In this Congress alone, no fewer than five bills in both Houses would tip the copyright balance even further toward the content industry. This is nothing more than a carefully planned, long-term assault on honest consumers to make them pay multiple times for uses that the law still considers fair.

Members of this Committee, legislation to close the analog hole would be profoundly anti-consumer and have no effect on piracy. I urge you to reject technology mandates and thereby preserve the careful balance inherent in our copyright laws. Thank you.

[The prepared statement of Ms. Sohn appears as a submission for the record.]

Chairman SPECTER. Ms. Sohn, do you think the Congress should take seriously any representation by anyone saying this is the last legislative fix we will ever ask you for?

[Laughter.]

Ms. SOHN. I think you answered your own question. We could go through the history. In fact, I don't know if you saw the ad that the CEA put in The Hill about the many times the content industry has come hat in hand to this body asking them essentially to preserve their old business models. Or they have gone to court.

Chairman SPECTER. We have noticed they are coming, but not hat in hand.

[Laughter.]

Chairman SPECTER. Mr. Glickman, lots of information about piracy from you and from the Department of Justice, but can you quantify any direct connection between piracy and the analog hole?

Mr. GLICKMAN. We have just completed a major study called the LE case study which estimates that our companies lose about $6.1 billion a year in piracy, and as part of that—

Chairman SPECTER. OK. I mean from analog—I have only got 5 minutes.

Mr. GLICKMAN. OK, $1 to $1.5 billion in what we call noncommercial copying of movies for family and friends. We believe a big part of that is due to the analog hole.

Chairman SPECTER. How do you arrive at the figure of $1.5 billion?

Mr. GLICKMAN. The firm did worldwide and national piracy study focus groups. The methodology we considered to be quite good.

Chairman SPECTER. Well, let me ask you to supplement your answer with the specifics as to how you come to that conclusion.

Mr. GLICKMAN. Sure, be glad to.

Chairman SPECTER. We would like to see the methodology because before we really tackle the problem, we want to know—before we really look for a solution, we would like to have a specification of the problem.

Mr. GLICKMAN. We will get you that, Senator.

Chairman SPECTER. Mr. Shapiro, you have marvelous technology, phenomenal. With all of the technological advances and the ingenious devices, why not an answer to prevent duplication? Is as much time spent on trying to avoid duplication as is spent on these new devices, to sell these devices to the consumers? I enjoy them as much as anybody, but why not a real technological effort to find a way to prevent duplication?

Mr. SHAPIRO. We believe that Americans believe and have the right under the *Sony Betamax* case to shift the content they have lawfully acquired in time and in place and to manage it. And that is a fundamental disagreement. This is not about piracy. This is about taking content that you have lawfully acquired and being able to use it elsewhere. What you heard from Mr. Cookson is they want to charge more every time you play a product. This is all about price discrimination.

We have embraced CGMS–A. We have tested it out. It is even in a CEA standard. Actually, most of our manufacturers are using CGMS–A. They have tested it and are comfortable with it.

This other thing called VEIL that no one has ever really seen or tested because you cannot talk about it and you have to pay a license fee is what concerns us most. But our products respond to Macrovision; our products respond to CGMS–A. We have worked very closely—we have developed a DVD standard with the motion picture industry that everyone is comfortable with.

Chairman SPECTER. Well, you talk about products legally acquired. That is really sort of a rabbit in the hat. Mr. Cookson has sent up an SOS, and before recognizing his hand signals, I would like to pose a question to him. How do you respond to this point that Mr. Zinn is making and Mr. Shapiro just made again that it is legally acquired? And Mr. Shapiro pointedly said to you, Mr. Cookson, you want to charge more money every time they play one of those Warner Brothers films.

Mr. COOKSON. Well, one of the things that I wanted to address is that all three of the people surrounding me here have spoken about your ability to timeshift, to watch something later, to watch it in another room of your house, the ability to take a clip of a basketball game and—

Chairman SPECTER. Come to grips with the issue on legally acquired. Has it been legally acquired and—

Mr. COOKSON. It is legally acquired, yes, sir, and the—

Chairman SPECTER. And should there be a limit—it is legally acquired. Should there be a limit then as to its use?

Mr. COOKSON. There is no limit proposed to the use of those things they spoke about. What I wanted to say and the reason I gave the SOS is that there is a misunderstanding. There is no proposal to limit the ability to timeshift, the ability to take content from your living room to your bedroom, the ability to take something off of a basketball game and record it onto a disk and watch it on an airplane. Those are all preserved in the bill as proposed, because most content, in fact, is marked for copying one generation and marked for the use in timeshifting. Only in very special cases things like video on demand, Pay-Per-View, or recorded media where you can control when the watching takes place is there a copy-never provision.

So it was not proposed by any of these that the things that they have mentioned would not be used in the way that they say it ought to be used.

Chairman SPECTER. Mr. Zinn, you had an SOS. I cannot ask you a question because my red light is on, and I do not permit anybody to do it, including me. But if you want to followup on your hand signal, go ahead.

Mr. ZINN. If copies are marked one generation and I copy it to my DVR, then I cannot make a DVD of it. I cannot transfer it from one DVR to another DVR, and I cannot transfer it from one DVR to a laptop to make flexible use of what is admittedly lawfully acquired content.

Mr. COOKSON. Here, again, this is a misunderstanding, sir. The technologies in the marketplace already that Mr. Shapiro's company has created and there are in place such as the 5C technology permit the copying to a DVR and then the moving to a DVD. So I think a lot of the opposition that you are seeing here today is really based on a lack of understanding of the technologies that have already come to market and the way that it is proposed that they be used.

Chairman SPECTER. Have you fellows finished your private debate now without intervention by the Chair?

Senator Leahy?

Senator LEAHY. I love the debate.

Again, I go back to what I said. I do not want to step on technology. I want the people who produce these things to be able to get paid for it and the people who have a legitimate interest, a normal interest, whether it is a performer, a writer, a producer, whomever, whoever is involved in the copyright, whatever the entity doing the copyright negotiates with the people who are involved in there but must share the profits they get, and that is fine. Nobody here is going to dictate that. I just want to make sure you get it.

Also, though, I think back to the days of the VCRs where if Congress had stepped in and basically put the brakes on technology, we could have been in a very serious area. So we have to have that balance. And there is nobody—you are probably the most knowledgeable people we could possibly have here, but none of you are going to be willing to tell me what the technology is going to be 10 years from now. You are working on what it is going to be a year from now or 2 years from now.

I want to get back to the money part. Secretary Glickman, who is an old friend of all of ours, you talked in your answer maybe it is around $1.5 billion from your study. And, Mr. Burton, what do you think it is?

Mr. BURTON. You are asking me, Senator, what I think the annual loss of—

Senator LEAHY. The analog hole problem, what are the actual losses in your mind?

Mr. BURTON. Well, I do not pretend to have all of the statistics, but I do know that as Senator Specter mentioned in my introduction, one of the things I am most known for is "Star Trek." I have been in this business for a long time, almost 30 years.

Senator LEAHY. You had a pretty impressive role before "Star Trek," too, sir.

Mr. BURTON. Well, I do not mean to make any of us feel old, but next year we will celebrate the 30th anniversary of "Roots" airing for the first time in this country, and there has been a lot of water under that bridge between then and now.

But "Star Trek," I think it is safe to say, is pretty popular worldwide, and its popularity is what makes it vulnerable to this kind of piracy. It was determined that in 2005 that were over 57,000

worldwide auctionsites of DVDs of movies and television that were available for sale, but those DVDs had not been released to the public as yet.

Senator LEAHY. I understand that, and also with the time limitations here. Does anybody—I mean, can we put an actual handle on this? What I am worried about, if you have, for example, $6 billion in worldwide piracy, and if this is around $1 billion worth, do we have bigger areas that we should be looking at, for example, our treaties by other countries, the enforcement of those treaties?

You are always going to have some form of piracy, just as you are going to have somebody come into a bookstore and shoplift a book. And we can create all kinds of penalties for piracy, but creating penalties or defining technology are two different things.

Mr. GLICKMAN. If I might—and we are going to get the Committee the information Senator Specter has requested. First of all, you are right, we are never going to be able to stop piracy. We have to stay ahead of it and control it through a myriad of ways, from enforcement and education and international treaties.

There is no question you have leakage with the analog hole; that is, you have digitized content that goes through the whole and—

Senator LEAHY. But, Mr. Glickman, you also have leakage when some of your movie theaters do not keep strong enough controls. You are going to have leakage when you go into more digital projection in your movie theaters.

Mr. GLICKMAN. That is true. The question here is: Is the leakages going to be like the levees around New Orleans after Hurricane Katrina? That is, do we believe that this hole is so vulnerable that the leakage will become a flood or an avalanche? In our judgment, that is, in fact, the case.

Senator LEAHY. Now, I will go back. You and I will have more chance to discuss this, but my time is running out.

Ms. Sohn, you say that there are other uses of the analog hole that have no adverse effect on the movie industry, like transferring old home movies to DVDs, something that, with the movies of my kids when they were little, now I am able to do, classroom use, and so on. If we bring up this legislation, how do we not stop that sort of thing?

Ms. SOHN. Well, one of the things that I recommended in my testimony, which will sound familiar to all of you, I think, is some sort of environmental impact statement. I really think you have to take the balance of what the impact would be on honest consumers, and I really do think that conflating honest consumers who want to transfer their home movies or who want to, you know, do video blogs using an excerpt of a DVD using the analog hole, you have to consider that, I mean, particularly—and balance that against the harm, the alleged harm to the industry.

I think we have made it pretty clear here that the things that the industry is complaining about are not going to be resolved by the analog hole. But it really, really needs to be balanced against what the consumers' harm is here. In my environmental impact statement, the harm to consumers would far outweigh the benefits to the industry here.

Senator LEAHY. Mr. Cookson had his arm up. He is the boss.

Chairman SPECTER. You go ahead.

Mr. COOKSON. I just wanted to clear up one thing. The proposal that is on the table would have no impact at all on your ability to digitize and record and transmit or do anything you want to with your own personal content because you would not have marked the content with any of the marks that would suggest it would be controlled. So that is something that I think is one of those misunderstandings that was mentioned.

Chairman SPECTER. Mr. Shapiro, you wanted to comment. Go ahead.

Mr. SHAPIRO. I have a number of comments.

First of all, there is an article, "The Problem with the MPAA's Shocking Piracy Numbers." It points out that the methodology has not been released and, indeed, that they are inflated, and, in fact, it is inside the U.S. The U.S. is already the tightest country in the world in terms of fighting piracy. It is one of the few countries to make the circumvention of DVD access controls illegal. It is working out very well, and this would carry us into the extreme of the extreme in terms of getting every last drop, and it would hurt consumers.

Second of all, again, the MPAA website says 90 percent of the piracy is people in camcorders in movie theaters, which Congress just made illegal. Now, Mr. Cookson keeps on saying that this would not affect any legitimate behavior of consumers. What it clearly would affect is their ability to use their own content in a way that they would wish, and at some point he is going to say exactly what it covers, what the legislation would cover, because the way we read the legislation, it covers absolutely every product with an analog output unless the Patent and Trademark Office says it does not, which includes literally thousands and thousands of products. And as Ms. Sohn said, you are talking about if this goes into effect, the products in people's homes downstream from that product would be rendered unusable. So if you just bought a new Yamaha Surround Sound processor, you spent $3,000 on it. Congress legislates, there is a mandate, you have a box which all of a sudden you cannot get your product in your TV set. And that is why the reaction of consumers to this proposal, if it is enacted, afterwards is going to—the retailers and the manufacturers are going to have to bear the burden of that, explaining why the products they sell just do not work.

Chairman SPECTER. Mr. Cookson, if you have another rejoinder, would you please make it brief?

Mr. COOKSON. It is another misunderstanding, sir, and so I think that we need to clear up that there are no controls over analog outputs at all. Those are all handled through private contracts. It is only the devices that do the digitizing with the analog input that we are talking about. The numbers in the MPAA website refer to the early window theatrical piracy, which is 90 percent, from theatrical screens. That is before the DVD has come out to copy. The DVD then becomes the source of piracy as soon as people can replace the camcorder from the screen. And so the data is being misconstrued a bit, sir.

Chairman SPECTER. Senator Hatch?

Senator HATCH. Well, I want to thank all of you for being here. This has been an interesting hearing to me. But one frequent criti-

cism I hear about the analog content protection legislation that was introduced in the House is that it covers virtually all devices that contain an analog-to-digital converter, including airplanes, cars, MRI machines, measurement equipment, and even some high-end toaster ovens.

Mr. Cookson and Mr. Glickman, how do you respond to that type of criticism? And, additionally, should we consider having some sort of a primary purpose test to ensure that devices are not typically used to handle the conversion of commercial video content, that they are not covered by legislation in this area? And anybody else who would care to answer after Mr. Cookson and Mr. Glickman, I would be happy to—

Mr. COOKSON. Yes, sir, if I could. The necessity that we see is to focus as tightly as possible on the fewest possible devices, and there are analog-to-digital converters in F–16s and, you know, in toaster ovens and in automobiles, and those are not sold to consumers with the purpose of taking analog television and turning it into data.

Products such as this, though, this product is a cute little thing that I think has a very legitimate use, as we mentioned, if you want to take your home movies and digitize them. This plugs into the front of your computer in the USB port. This product, though, we have no basis for dealing with in the contractual way that we deal with the manufacturers who do things like make DVD players and so on.

So the products that are sold for the purpose of taking analog input video and turning it into data are the only products that we would seek to regulate.

Mr. GLICKMAN. I just would add to that. Three major consumer electronics manufacturers—Thomson, Toshiba, and IBM—have basically endorsed the legislation, and I just would read to you from the Thomson letter: "The hole allows for digital entertainment to be played in analog form and then redigitized. Thomson acknowledges that the analog hole is a problem that has not been readily solved by voluntary efforts."

So this is not an issue that pits the manufacturers and consumers and the content owners against each other. It is an issue that we ought to be able to embrace a legislative solution together.

Mr. SHAPIRO. Oh, come on. Thomson is virtually out of the consumer electronics business. They own Technicolor, and this is their biggest customer sitting next to me. That is like saying someone from the motion picture industry has endorsed this legislation, congratulations.

[Laughter.]

Senator HATCH. I take it you smell something wrong here.

Mr. GLICKMAN. Would you say the same thing about Toshiba and IBM?

Mr. SHAPIRO. First of all, IBM is not even in the electronics business for the most part anymore. I don't know what Toshiba is doing, but they did not endorse the legislation. What they said is they used CGMS–A as virtually every manufacturer does. There is not a manufacturer that you could show me that will embrace the VEIL technology because they have not seen it. And if they do see it, they are not allowed to talk about it. They have to pay, and they

sign a nondisclosure agreement. So to have Congress come when this has not even been vetted with the industry and to say make this a law that has to be, you know, literally hundreds of millions of products, it is just—it is the biggest reach in copyright history.

Senator HATCH. Mr. Zinn, I hope you can be short. I have one other question.

Mr. ZINN. Just to pop up a little bit, we are getting a little in the weeds, but I think there is kind of a white elephant in the room here, and that is, we have not identified what the problem is. Is the problem piracy, stopping piracy? Or is the problem stopping indiscriminate redistribution of content over the Internet? Or is the problem that consumers have too much flexibility in the home and Mr. Cookson cannot make as much money as he wants from monetizing that concept?

Senator HATCH. One of the problems is being able to digitize and then put it online, and that is what I think the movie industry is more concerned about. I don't think this is as big a problem as some think it is.

Mr. ZINN. I would agree with you.

Senator HATCH. Ms. Sohn, in your written testimony you assert that adopting legislation similar to what the movie industry has advocated would immediately "make millions of consumer devices obsolete." Now, if the legislation merely contained—let's say we pass legislation that merely contains a prospective requirement that new devices recognize and respect the copy protection information, how does that make millions of legacy device obsolete? And won't digital converters and digital recorders simply continue to work as they do now?

Ms. SOHN. Could you repeat the question one time?

Senator HATCH. Sure. You are asserting that adopting this legislation, similar to what the movie industry has advocated, would make millions of devices obsolete. Now, if the legislation merely contains a prospective requirement that new devices recognize and respect the copy protection information, how does it make millions of legacy devices obsolete?

Ms. SOHN. Well, I actually have some charts that I would like to submit for the record—

Senator HATCH. Sure.

Ms. SOHN.—with your indulgence that show exactly that. So here we have an example of—let's say we have analog hole-compliant television set and a legacy Slingbox, OK? So what will happen is when the signal gets to the Slingbox, it will strip out the CGMS–A. That is what is indicated here by the lock. It will go to the Slingbox and out will come the VEIL signal, all right?

Now, the default on the VEIL signal is copy never, so if you want to then see it on your mobile phone or on your computer, you cannot because VEIL tells you essentially that you can copy never. So this Slingbox, therefore, becomes completely and totally obsolete.

Senator HATCH. OK. Mr. Cookson?

Mr. COOKSON. The misunderstanding in this case is that the VEIL presence always permits viewing. There is never a restriction on viewing anything. All content can always be displayed. The only question is whether or not it can be copied.

Ms. SOHN. It is not viewing. It cannot record, so it says you cannot—the VEIL does not allow you to record it.

Mr. SHAPIRO. If there are so many misunderstandings among the experts from the technology industry on this panel, I just cannot figure out how consumers are ever going to be able to deal with this and understand what occurs when they are frustrated. And who are they going to go to? Who is going to explain it? And that was the objection of the motion picture industry audience saying who is going to explain to consumers that they cannot do what they have always been doing and why they are not able to do that.

Chairman SPECTER. Do you want to break tradition, Mr. Cookson, and seek recognition?

[Laughter.]

Mr. COOKSON. I apologize, sir.

Chairman SPECTER. No, no. It is the other way around. But you go ahead.

Mr. COOKSON. In terms of what consumers can do, as Mr. Shapiro pointed out—and I think it is worthy of appreciation on our part—many of his manufacturers do look for CGMS–A. In fact, there are many manufacturers who make DVD recorders that, if you plug into the analog input—you take the output of your analog, output of your DVD player, and plug it to your DVD recorder. The recorder will tell you it cannot copy this material because it is copyrighted.

The issue we have is that that is a laudable thing for them to be doing, but there is no obligation to do so. Many of his members do that because they do recognize and respect copyright, and we appreciate it. There is no reason, though, that their competitors have to do the same thing, and we have seen some products come to market touting the ability to make back-up copies of your DVD. This product here is a product that does not do this.

So a product made by one of his manufacturers that does look for the CGMS–A and does respond exactly as we are proposing today in the legislation is something consumers already have in the market. We are asking to level the playing field so that those who do not respect copyright and who do not look for the code would do the same as his many members today do do.

Chairman SPECTER. Well, now we have two people seeking recognition. Like in the Senate, whoever sought it first. Go ahead, Mr. Shapiro.

Mr. SHAPIRO. A brief response.

Chairman SPECTER. Make it brief. We are running over time, but go ahead.

Mr. SHAPIRO. The vast majority of companies—in fact, probably all of our members do have CGMS–A, and privately agreeing with the motion picture industry, this makes sense. If companies choose not to do that, and if those products are indeed being used in ways which violate the copyright law, then under the Supreme Court decision, the well-funded content industry can bring a lawsuit and put that company under even before it is determined, saying you are inducing a copyright violation.

The point here is these are not copyright violations. These are activities that consumers are accustomed to doing. They want to

manage. They want to TiVo. They want to shift their content in time and place. And that is what is being denied here.

Chairman SPECTER. A rejoinder, Mr. Zinn, briefly.

Mr. ZINN. Well, we keep coming back to the copying of DVDs, and DVDs are not copied under the analog hole. Sure, they can be, but that is not how you would do it. You would do it using DVD copying technology that is readily available on the Internet, and it is cheaper, and you do not need—

Chairman SPECTER. And your hand is up again, Mr. Cookson?

[Laughter.]

Chairman SPECTER. Go ahead, but make it brief.

Mr. COOKSON. We are introducing new DVDs and Blu-ray disks, which are high definition. They have analog outputs on them. There is no hack. There is no way to record those things digitally.

We are very concerned that we have seen new products that have come to market today costing as much as $1,500, but very soon in this price range, that digitize the high-definition outputs of the DVD or Blu-ray players. And there is no means that we can see to prevent that other than making strictly digital outputs for high-def and saying that the people who have analog outputs cannot see high-def, and I think that that is something we would like to avoid. And we think that if there is a means of getting reasonable protection from the digitization of the output of those high-definition signals other than denying high-definition to people with analog TV sets, that would be a better alternative.

Chairman SPECTER. Well, thank you all very much. This has been an unusual hearing. I think that we might promote the quality of this hearing by having the Senators leave the room.

[Laughter.]

Chairman SPECTER. And after the Senators leave the room, you can continue the hearing.

But on a very serious note, the idea of having you get together and try to hash it out is one which I think you ought to pursue. And we had a session in my office on June 6th, and I am prepared to do it again. But I think it would be useful if you met in the interim. And it may be that you ought to make a limitation. Senator Hatch points out the scope of the proposed legislation on so many lines. If you limit it to video or audio-video, something more narrowly focused, it might not be quite so complicated. Or if you are talking about patent infringements on mandated approaches, perhaps the legislation ought to provide immunity if you are doing something which the Government orders you to do. I am not saying that is necessarily going to be the result, but those are ideas you can come up with. You do not really need for us to do that. And if you find an answer jointly, you will be a lot happier with it than what is imposed by the Congress.

Senator HATCH. Or the courts.

Chairman SPECTER. Or the courts, right. And Senator Leahy notices the high-powered nature of the audience today. He was doing—well, you speak. He was doing a multiplication factor of the cost of this hearing to the principals of all those in attendance. It is high than when he practiced law, or I did, or Orrin did, on our hourly rates.

Senator LEAHY. It is about equal to the gross domestic product of the State of Vermont.

[Laughter.]

Chairman SPECTER. Well, thank you all very much for coming. This is a matter of great importance, and we want to know more precision about the losses. And we would like to see if somebody can come up with an idea as to technologically how to solve it. I think the great effort of technology is directed to finding a product that will sell on the market, and that is the American system, but there ought to be some efforts made to find a way to close the opportunities for property right infringements as you go along because of the serious concerns and the serious interests which are involved.

Thank you all, and that concludes our hearing.

[Whereupon, at 10:49 a.m., the Committee was adjourned.]

[Questions and answers and submissions for the record follow.]

QUESTIONS AND ANSWERS

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July 21, 2006

The Honorable Arlen Specter
Chairman
Senate Judiciary Committee
224 Dirksen Senate Office Building
Washington, DC 20510

Dear Chairman Specter:

I have taken the liberty of responding to the questions the Committee requested from DGA National Board member LeVar Burton. The DGA was pleased to testify during last month's hearing regarding "The Analog Hole: Can Congress Protect Copyright and Promote Innovation?" We thank you for the opportunity to present the filmmaker's unique perspective.

Attached, please find our responses to the three questions asked of us. In addition, I have attached a copy of an article, "Stolen Moments" that was published in DGA's premier issue of the "*DGA Quarterly*" magazine. It examines how piracy has a material affect on directors and the directorial team.

Please don't hesitate to contact me if you or your staff have any questions.

Sincerely,

Jay D. Roth
National Executive Director

1. CAN YOU QUANTIFY YOUR ASSOCIATION'S LOSSES THAT ARE ATRIBUTED SPECIFICALLY TO PIRACY VIA THE SO CALLED "ANALOG HOLE"?

2. HAS YOUR INDUSTRY EXPERIENCED A DECLINE IN SALES IN THE PAST FIVE YEARS? IF SO PLEASE ELABORATE.

3. CAN YOU GIVE THE COMMITTEE AN ESTIMATE OF HOW MUCH IN POST-RELEASE SALES ARE GENERATED ANNUALLY?

The Directors Guild of America represents film and television directors and other members of the directorial team that provide services to film production companies. As a Guild whose members are employed by film production companies, we are not the entity that collects industry wide data on the specific amount of losses attributable to the "analog hole" and any other form of piracy. Nor do we have the access to information that would enable us to collect other industry-wide sales data. We do collect information on the revenues generated by individual productions from which our members are allocated residual income. That kind of data, however, does not provide any insight as to losses from the "analog hole" or other forms of piracy.

We of course work closely with film production companies, follow the information they release on piracy, and fully share their concern for the effect the "analog hole" is having on industry earnings.

As we stated in our testimony, film piracy has very important economic consequences for directors. Because a significant portion of compensation to the members of the Directors Guild depends on residual payments -- which are fees paid for the *reuse* of films and television programming on pay and free TV and through DVD and VHS sales and rentals -- the result of any form of piracy is less residual revenue that go directly to our members and to their industry managed pension plans.

But this is only one effect of film piracy. Of even greater concern to our membership is the broader effect that the "analog hole" has on overall industry revenues. To the extent films earn less revenue, the number of productions that can be financed is reduced, costing our members and other film industry workers employment opportunities.

This is no an abstract concern given recent press reports about studios laying off hundreds of workers as they struggle to cut costs in the wake of weak film earnings.

STOLEN MOMENTS

By James Ulmer

Piracy is the biggest threat in the industry, not only to the studios but also to directors–creatively and financially. It's a lesson Taylor Hackford learned with the rampant rip-off of *Ray*. Here's how it happened.

Less than a week after his film Ray opened nationwide last October, director Taylor Hackford was walking down Canal Street in New York's Chinatown. As he passed a vendor, he saw a stunning sight: there on the sidewalk were dozens of gleaming copies of the new Ray DVD, more than three months before it was due to be released. The covers of the discs even sported the movie's photos, credits and logos. It all looked amazingly real.

As he examined the fake packages, Hackford realized he had stumbled upon only one of the most visible pieces of a serpentine piracy trail. Later, he would discover that trail had already slithered many times around the world, from New Jersey to Russia, China and to over 60 countries beyond, and would eventually take him to the halls of Capitol Hill. He would learn that the stolen bounty in his hand had shape-shifted from an original camcorded master to thousands of optical discs, which then spawned an estimated 1-2 million online files swapped blithely by cyber pickpockets who would probably never be seen or caught.

He suddenly thought: Is this what 15 years of impassioned work on Ray Charles' life, what thousands of man-hours by dedicated actors and crew and production staff, had boiled down to–a cheap rip-off hawked by scam artists?

"How much?" he asked the vendor.

"Fifteen dollars." Hackford knew that if he bargained, he could probably get it down to 12.

But there are no bargains to be had in Hollywood's piracy wars. The Motion Picture Association of America estimated that $3.5 billion annually is lost in movie theatre revenues and DVD sales to hard goods theft–not including Internet piracy–and the investment firm Smith Barney predicts that number has already gushed to $5.4 billion.

It's easy to see why the studio distributors represented by the MPAA are hot on the trail of pirated product. As owners of their movies' copyrights, they stand to bear the brunt of those billions in lost revenue. But how does movie piracy affect the DGA and its members? Unlike their counterparts in Europe, directors in the U.S. are not the copyright holders of their work. Consequently, the creators' voice has almost always been left out of the growing piracy debate.

The DGA has begun to change that. Learning of his experience, the Guild asked National Board member Taylor Hackford to testify on behalf of the DGA before a Senate Judiciary Subcommittee hearing on piracy. The Guild's first mission was to push Congress to leverage pressure on the world's two greatest centers of DVD and videocassette piracy, Russia and China. But the DGA also wanted to shine a spotlight on the very real issues facing creative artists caught in piracy's wake.

"When pirates steal movies, they are not simply robbing movie studios of revenues," Hackford explained to the senators. "They're taking money directly from our pockets and the pension and health plans that support us and our families."

It is not only the tangible economic losses that have sent the Guild on an impassioned crusade against intellectual property theft. Movie piracy is also forcing fundamental changes in the ways directors ply their craft.

For Hackford, the initial impact of piracy hit home while he was editing Ray. The director has always had a soft spot for screening his unfinished features for an audience. "I want to be there myself to see how the audiences respond, to learn from them and incorporate that into the editing process," he reports.

But when Hackford decided it was time to take an early cut of Ray out to meet an audience, the movie's producers resisted. "They were afraid the movie might get stolen," he said. "At that point it all became an entirely different experience than anything I'd known before. My creative process was being stopped because of the fear of piracy."

Beyond the process of making a movie, the vision of the director is at risk, too. The quality of camcorded copies of feature films is extremely poor compared to legitimate optical discs. And pirates can edit and otherwise manipulate digital copies of films in ways that distort a director's intentions.

But creative infringement is just one consequence of the piracy of movies and television programs on optical discs, videocassettes and Internet files. Which brings us back to those "hot" copies of Ray on Canal Street.

TRACKING SHOTS

Hackford well understood how the pirate's booty spread out on the Chinatown street could be traced. As a director, producer and editor, he was familiar with the use of visual watermarks placed onto the prints of films–both by the production during the editing phase and by each movie theatre during its exhibition–to help track counterfeit copies. Ray's distributor, Universal Pictures, reconstructed nearly every step of the illegal journey, and it wasn't long before Hackford knew just how his movie was stolen, and from where.

Like most movie theft, Ray was first taped by hidden camcorders in a movie theatre–in this case, two local theatres: the Loews Raceway 10 in Westbury, New

York, and the Loews Jersey Garden Theatre in Elizabeth, New Jersey. Both camcordings were made on the first day of Ray's release, and set in motion an international twist in the film's piracy trail.

Almost immediately after it was taped, the entire movie was uploaded to the web on the East Coast and downloaded at a mass production optical transfer house in Russia. Within days of its opening, illegal copies of Ray's 'camcord editions' were found not only on Canal Street, but all over New York, California, Florida, Georgia, Texas, and in Europe, Russia, China and dozens of other countries. All told, the Internet piracy of Ray has been identified in 68 countries, Hackford reported to the Senate subcommittee. "And that's just what we have data on."

In fact, Russia represents one of the two prime culprits for mass-produced DVD piracy worldwide. (The biggest is China, where a whopping 95% of all films sold are illegally copied and an estimated $300 million in revenues are lost annually.) The optical disc plant where Ray was copied is only one of 34 that have sprouted up in Russia, 27 of which have been linked to piracy activity and various organized crime networks, according to the MPAA. That's an exponential increase from the two facilities that existed in 1996.

The MPAA estimates that pirates bleed the U.S. film and TV industries of $275 million a year in lost income–accounting for untold losses in DGA residuals.

Compounding the problem are the massive inducements for DVD thieves. As crime goes, piracy is great business. It offers high profits at low risks, and it's a lot safer than drug dealing, a traditional activity of many organized piracy groups. Time magazine has reported, for example, that while drug dealers can make 100% profit on the sale of cocaine and about 400% on the sale of heroin, pirates can reap a whopping 800% profits on the sale of illegal DVDs. And while drug dealers risk maximum jail time and even execution in some countries, pirates frequently get a slap on the wrist–minimal fines and no jail time.

Kathy Garmezy, the DGA's Assistant Executive Director for Government and International Affairs, states the problem frankly: "You can make a great deal of money, and more often than not, without getting caught. This makes it very attractive to organized crime."

How can the industry help stem that flow of lost dollars from hard goods piracy? John Malcolm, the MPAA's Senior Vice President and Director of Worldwide Anti-piracy Operations, has achieved significant success by applying many patches to a fast-spreading problem that ultimately, and frustratingly, requires a tourniquet.

"We pick up hard copies all the time, we have forensic facilities we work with to figure out where the discs, like the copies of Ray, are manufactured," he reports. (The MPAA oversees around 26,000 raids a year of street vendors, retail outlets, labs and warehouses worldwide, resulting in the seizure of nearly 30 million illegal

discs and videos in the first half of 2004 alone.) "We can trace shipping records, we develop informants. But pirates are remarkably good at evolving their practices to elude us, so we're trying to engage them at every point."

That engagement includes firing up one of Hollywood's most pro-active new weapons in its anti-piracy arsenal: shortening the distribution window between a movie's theatrical and DVD release. Reluctantly, Hackford came face-to-face with this strategy while he was editing Ray. The threat from pirates was so great that Universal decided to push up the film's DVD rollout by several months (instead of waiting the customary six months after its theatrical opening), making it one of the shortest windows of any major film.

"I questioned the strategy, and I still think we probably left $25 million on the table in theatrical revenues by putting out the DVD so soon," Hackford said. "But Universal insisted there's money to be made by the early release, and in the end, I thought it was the right decision."

WHAT COST CYBER-THEFT?

The pirates on Chinatown's streets are small pickings compared to the millions of bandits hanging out on that global superhighway of movie theft: the worldwide web. Online piracy is perhaps the most virulent form in the market today; While it accounts for only a fraction of the lost dollars that hard-goods piracy racks up, there is no question that its toll is growing. The MPAA hasn't yet calculated how much income may be lost to online theft, but the Beverly Hills-based tracking company Big Champagne has reported an ominous figure: as of March 2004, 28 million feature film files were illegally available for download on peer-to-peer (P2P) networks. The number has surely grown since then.

Following the trail of piracy surrounding Ray, Universal uncovered a mind-boggling statistic. From the time of its release until Hackford's May 25, 2005 testimony in Washington, there had been 42 million global hits to download the film through P2P networks, with 476,000 requests made in one week alone.

"My first response was, frankly, to be somewhat flattered–all those people wanting to see my film!" Hackford recalls. "But I was incredibly shocked at the same time, because [my work] is being stolen every day, and income is being lost by me, my financier [the investor Philip Anschutz], the studio and all the workers on my film."

The extent of that loss is a matter of conjecture. Hackford conservatively estimates that given the fairly lengthy data transfer times, probably only 10% of those 42 million hits for Ray resulted in actual downloads. That would represent 4.2 million potential DVD sales that were lost. If that figure were added to the total amount of DVDs expected to be sold legitimately worldwide, "that would be a phenomenal number," says Hackford. And that doesn't include the number of worldwide sales of

Ray lost to street and store piracy, a figure too nebulous to estimate for an individual title.

Imagine, then, the amount of lost DGA residuals from just this one movie. In a first-of-its-kind exercise, staffers at the DGA recently did just that. Unofficially, they estimated what the loss might be in DGA residuals for a single, pirated DVD of a studio-released film like Ray. Here's the math:

Assuming an average, worldwide retail purchase price of U.S. $12 for one DVD (and prices can vary considerably), plus the 4.2 million in lost sales, then the total DGA income siphoned off by Ray's online piracy–not including its hard-goods piracy–would equal $90,120. That stacks up to a $60,483 loss for Hackford, a $12,013 shortfall for his crew, and $18,024 missing from the coffers of the DGA Pension Fund. And that's just the projected loss in Internet piracy for one movie.

And the problem of Internet theft will only mushroom as use of the Internet becomes faster, cheaper and more efficient. Broadband penetration is expected to reach 60% in the U.S. by 2007, according to the MPAA. The speed of transferring feature film files has already been slashed to a mere three seconds through technology like I2hub, a super-fast version of the Internet that connects more than 300 universities and institutions. Cal Tech reports that supercomputer physicists and engineers have already achieved data transfer speeds equivalent to downloading three full DVD movies per second. With bootlegged movies flying through the ether that fast, how can the DGA, the MPAA and the rest of the movie industry hope to stop cyber-thieves?

"Sure, we have online investigators checking out how many copies of a film are distributed and who are the first groups to post a movie," reports Malcolm. "But are we suing and prosecuting a very large percentage of people who are downloading and uploading films? No, because at any given moment hundreds of thousands, if not millions, of people are actively trading copyrighted material of all types."

Despite the limitations on enforcement, the industry has won some important legal victories that may help dull the pirates' swords. Last spring, the industry's ongoing fight to eradicate illegally camcorded movies took a giant step forward when Congress passed and President Bush signed into law anti-camcorder legislation, making it a federal felony to record a movie projected in a theatre. It also bans a company from offering a movie or music file online before it is released for sale.

In June, the U.S. Supreme Court ruled that companies that actively promote the free downloading of music or movies could be held liable for their customers' illegal acts–a clear victory for copyright protection in an online world. While the Court didn't actually settle the industry's claims against the two defendants, the filesharing companies StreamCast Networks Inc. and Grokster Ltd., the decision stated that unauthorized file sharing is illegal, thereby providing an extra weapon in the industry's anti-piracy fight.

"I think this decision will be helpful, because anything that inhibits people from doing peer-to-peer exchange for free and discourages piracy is good," says Hackford. "We have to make this a violation of the law."

Others, however, aren't so optimistic. Some contend that there are dozens of file-sharing networks that downloaders can quickly shift to at the first sign of a crackdown. And P2P operations, if threatened, can simply move overseas, where online intellectual property theft is greeted with far less strict laws and enforcement, despite the industry's efforts to promote greater international cooperation in these areas. Some also fear that the ruling's threat of big lawsuits might discourage legitimate companies from designing new products intended for lawful use, because these products would almost certainly expose the companies to litigation if they ever got into the hands of pirates.

A NEW GENERATION GAP

Another problem faced by MPAA and law enforcement authorities is the potential for bad publicity. The vast majority of online thieves are hardly callous criminals operating out of grungy, padlocked urban coves; they're teenagers and college kids and older professionals, "operating" out of ordinary homes and offices around the world. Who wants to be the one to prosecute John Q. Student for downloading a Britney Spears song or a Disney movie?

Certainly prosecutors and the MPAA would prefer to focus on groups who abuse copyright law, rather than going after individuals. The MPAA, for example, has filed lawsuits in four continents against 100 owners of bitTorrent Trackers, eDonkey servers and Direct Connect hubs–P2P index and file-sharing servers that Malcolm says "profit on the back of theft" by catering to pirated material. Still, individuals are not completely beyond the industry's sights, if only as highly-publicized deterrents for the wider population. Two studios and a number of record companies recently filed suit against dozens of California students for illegally using super-fast I2hub filesharing technology. The students, sued as "John Does," are subject to fines up to $150,000 per movie or song copied.

Faced with a disease like piracy that spreads so quickly, eludes detection and often outwits the means to fight it, this may be one of the more effective–though controversial–defense strategies for Hollywood: to demonstrate the consequences of illegal downloading.

"It's an issue of changing a mindset," says the DGA's Garmezy. "Most people don't have any sense of the implications or who they're really stealing from. If you don't have a sense of who you might be hurting, it's hard to make this problem real."

But for younger online pirates, the problem isn't just educational, or even a case of prevention. It's generational. As Hackford puts it: "These kids are the babies of the Internet generation. They're literally born into an understanding that this is all free

exchange, that open access is practically a birthright. Changing that is going to be tough."

So what options are left for fighting piracy in the future? "I, for one, am skeptical that a be-all and end-all solution exists," says Malcolm. "Even as we take greater enforcement actions, pirates can always find new technologies to use." Still, Hackford believes a number of new and cutting-edge technologies in detection and encryption might be the best answer to fighting movie theft. "I think better technology is the only thing that's going to work for us," he says. "It's got to be the main way we control the illegal dissemination."

Hollywood is currently debating another way to control it, too: reducing the already shrinking window between theatrical and DVD release down to nothing. Like many, Hackford maintains that the day when a film's DVD debut arrives day-and-date with its theatrical bow is virtually inevitable. (ABC/Disney recently announced it would endorse this option, a move that predictably drew howls of protest from the National Association of Theatre Owners.) Already, Mark Cuban's HDNet Films is planning a slate of movies scheduled to be released on its cable network, in theatres and on DVD, all on the same day. Director Steven Soderbergh has signed on to deliver eight films for the company.

"Clearly this is coming sooner than most would anticipate," Hackford says. "As a director, I love to make films for a big screen, for a common experience within a cinema. But in the future, many more people will see my films on a small screen at home than on a large one. And there's something sad about that. Tragic, actually."

Still, the DGA remains undeterred in its anti-piracy efforts. Given the challenge of facing an enemy that so powerfully tests the limits of technology, ethics, enforcement, education and even geography, it is the commitment of the Guild and the example of directors like Hackford that may be one of Hollywood's best hopes for tracking, and trouncing, the pirates of tomorrow.

"We as the DGA must offer tremendous help with this issue," Hackford insists. "We have to communicate to Washington, and to our own members, that this battle has a huge impact on our work, our health and our pensions. If we lose, these can all be decimated. Nothing less than our lifeblood is at stake."

Senator Specter
Questions for Chris Cookson
President
Warner Bros. Technical Operations Inc.
Chief Technology Officer
Warner Bros. Entertainment Inc.

1. Mr. Cookson, many opponents of the MPAA-supported legislative solution have centered on the choice of VEIL technology as a means of closing the so called "analog hole." Can you explain to me why VEIL was chosen and whether alternative technologies exist?

Answer: VEIL was proposed by the motion picture industry as a technology for use in closing the analog hole for several reasons. First, the VEIL technology is embedded into the actual picture of the filmed content. This means that it is difficult to separate from the content in analog form without seriously degrading the content. In contrast, CGMS-A is not embedded in the actual image part of the filmed content and can be readily, sometimes even inadvertently, removed or stripped out. In some instances, such as with VGA connections to computer monitors, there is no way to put CGMS-A into the signal. Therefore, VEIL is useful for acting as a back-stop to the removal or other lack of CGMS-A.

Second, VEIL is the best alternative to using a video watermark. When solutions to the analog hole were first being discussed, many studios preferred to use a full-fledged video watermark for purposes of closing the analog hole. However, many consumer electronic and computer companies objected to the use of a full-fledged video watermark solution because of the implementation burdens and other implications associated with detecting and responding to such watermarks. VEIL was proposed by the motion picture industry as a compromise solution because its implementation burden on consumer electronics and computer manufactures is roughly $1/10^{th}$ of the implementation burden required for a typical full video watermark.

Third, a number of different companies hold patents in the video watermarking area. Because Veil is an older technology, it minimizes the potential patent minefield problems of other technologies.

Fourth, the owners of the VEIL technology have agreed to license it on reasonable terms. No royalties or ongoing fees are charged to product manufacturers (i.e., the manufacturers of analog-to-digital converters covered by the proposed legislation). Instead, a one time of administrative fee of $10,000 is charged for a long term license to embed VEIL detectors in an unlimited number of products and devices.

Fifth, the VEIL technology was selected by the motion picture industry only after multiple rounds of vigorous and extensive testing conducted by the well-respected consulting firm National TeleConsultants. The VEIL technology was tested for its

robustness against analog attacks, reliability across one generation of analog transmission, and visibility by the human eye. In all three categories it met the testing standards that had been established jointly by the consumer electronics, computer and motion picture industries in prior rounds of watermark testing.

2. Mr. Cookson, can you estimate how much will it cost the consumer electronics and computer software industries to incorporate the legislatively mandated technologies into covered products?

Answer: Our estimates are that there will be a cost of $0.01 to $0.015 per device to implement the VEIL technology into hardware and less for implementation in software.

In 2004, a variant of the VEIL technology was developed for use as a content protection technology. A system was designed using the VEIL technology to create the VRAM (VEIL Rights Assertion Mark) as a point solution addressing the analog hole. The VRAM, in conjunction with CGMS-A, gives content owners the ability to mark their content with usage rights in a robust manner that is, at the same time, simple to detect.

Detection of the VRAM is a much less burdensome operation than detection of a typical video watermark. During VRAM detection, a VEIL decoding algorithm extracts the VEIL energy from selected frames. The VEIL energy measurements are then applied to a statistical calculation algorithm that determines the probability of the VRAM being present within the frames. Over time, the statistical analysis will determine to sufficient certainty whether or not the VRAM is present within the analyzed video content. The low number of per-pixel operations and simple statistical methods used result in a low complexity decoder that carries a very small burden of implementation.

The typical level of resource on a computer chip to detect a standard video watermark is expressed as approximately 100,000 to 250,000 gates whereas the typical gate count to detect the VRAM is approximately 15,000 gates. We are advised by independent authorities that VRAM detection in silicon chips would cost approximately $0.01 - $0.015 per chip. Assuming that a device does its detection in a single analog to digital video detector, as opposed to doing so in software, the result would be a cost per device of $0.01 - $0.015.

Detection of the VRAM can be accomplished in either hardware or software. The VRAM decoder algorithim has a very low memory footprint. Assuming there is sufficient overhead in the processor performing the decoding, no additional cost should be necessary to implement the VRAM detector in software. The technology licensor provides a reference hardware decoder in the form of Verilog hardware description language and a software implementation of the VRAM decoder to all VRAM adopters.

3. Mr. Cookson, does the movie industry currently incorporate the cost of piracy into its prices for consumer offerings?

Answer: I cannot answer the question on behalf of the movie industry and can only refer to the pricing practices of Warner Bros. At Warner Bros., we take into account a variety of factors in pricing our consumer offerings. These factors include market research and elasticity of consumer demand, competing channels and formats of distribution (e.g., DVD versus Pay-Per-View), and competing forms of entertainment (e.g., video games) among others. In this complex process, we also take account of losses anticipated due to piracy. Prices to consumers may or may not be able to be raised to cover these losses and many times the price is even further eroded when consumers see the same content as being widely available for free. Moreover, as we test new channels and methods for distributing our content, we constantly take into account whether or not the distinctions and bounds of the various offers we are attempting to put before the consumer can be maintained. This includes constructing a realistic economic model that takes into account losses due to piracy.

4. Can you explain the effects of analog hole legislation on a company like TiVO?

Answer: For the majority of the digital video recorders (DVRs) that TiVO and its competitors provide, the proposed analog hole legislation will have no impact because these recorders are typically integrated into satellite or cable set-top-boxes and have no analog-to-digital video converters. They instead rely on direct digital video connections. The only TiVO devices that would be affected would be stand-alone TiVOs, with an analog video input and a video analog-to-digital converter. The proposed legislation would not outlaw such devices. Rather, on a strictly prospective basis and within a time frame adequate to allow implementation, TiVO would need to equip these devices so that they detect CGMS-A and VEIL on the analog-to-digital converters and respond to the usage rules. Under the proposed legislation, these stand-alone TiVOS would be permitted to record and play all television programming as they do today with the limited exception of pay-per-view and video-on-demand.

5. Can you explain why you need a tech mandate to fix the analog hole? Why can't this be done in the marketplace?

Answer: We believe that technology mandates should be sought only as a last resort and are appropriate only in circumstances where there is no available marketplace solution, such as in the case of the analog hole problem. Marketplace solutions are based on commercial relationships where each party receives value from the other. Content protection structures that are created in the marketplace depend upon the first step of encrypting/scrambling the content.

When content is encrypted, a license is required to obtain the key to legally de-crypt the content. This license then imposes obligations to ensure that the content is

adequately protected once it is decrypted. The negotiations over such licenses are market-driven: device manufacturers want access to the encrypted content and content providers want the device manufacturers to protect the content against unauthorized copying and redistribution.

However, once the encrypted digital content is converted into analog, it appears "in the clear" and the device manufacturer has unrestricted and complete access to use it in any way desired. Thus, there is no longer a market-driven contractual basis on which to build a voluntary agreement that would attach conditions to the access and use of that content. The market-driven approach to the roll-out of new digital content offerings that involve technical protections against widespread illegal copying and redistribution of the content simply doesn't work when it comes to analog signals and particularly to the problem of analog signals that have been redigitized.

All three industry groups (motion picture, consumer electronic and computer) that participate in the Copy Protection Technical Working Group recognized this dilemma as a precursor to the formation of the Analog Reconversion Discussion Group, which examined potential technologies to address the problem. Even the Consumer Electronics Association (CEA), in testimony before the House Judiciary Committee last year, recognized that the analog hole is a legitimate problem worthy of a legislative solution. At the hearing, Michael Petricone, Vice-President of Government Affairs for CEA, stated, "We have no objection to addressing the analog hole issue and in fact have worked extensively with the content industry in the past to do that."

For these reasons, the analog hole problem cannot be adequately addressed by privately negotiated agreements in the marketplace.

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DAN GLICKMAN
CHAIRMAN
AND
CHIEF EXECUTIVE OFFICER

July 20, 2006

The Honorable Arlen Specter
Chairman, Senate Committee on the Judiciary
United States Senate
Washington, D.C. 20510

Dear Chairman Specter,

I wanted to express my appreciation for providing the opportunity for the MPAA's voice to be heard at the hearing on "The Analog Hole: Can Congress Protect Copyright and Promote Innovation?" Please find attached my answers to the questions submitted by the Committee. This is an important issue as we move forward into the digital age, and your thoughtful consideration of these matters is of great value during this ongoing debate.

I would also like to add a brief clarification to the hearing record of that proceeding. The purpose of such an addition would be to help clarify the characterization of the letter from IBM regarding technological solutions addressing the analog hole. About mid-way into the hearing, I referred to letters written by IBM and Thomson discussing technological measures addressing the analog hole. I would like to modify my description of these letters by adding to the record the following:

> IBM and Thomson have submitted letters to the Chairman indicating that the analog hole is a real problem and that the technical solution proposed in the draft legislation of CGMS-A plus Veil is a viable and reasonable technical solution for addressing the analog hole.

Any help you can provide in making this clarification part of the record would be greatly appreciated.

As always, thank you very much for your support and interest in our issues. If there is ever anything I can do to be of assistance, please do not hesitate to call.

Best,

DAN GLICKMAN

1. **Mr. Glickman, could you please provide the Committee with statistics relating how much piracy results from the analog hole? If there are no such numbers, could you indicate the basis on which the movie industry bases its assertion that closing the analog hole could solve its piracy problem, providing related studies, statistics, and numbers?**

While the analog hole poses a significant film piracy problem, we wish to clarify that closing the analog hole will NOT "solve" this problem. Motion picture piracy is multifaceted and there is no single solution to the piracy problem. Closing the analog hole will eliminate a major source of film piracy, save jobs, protect balance of payment earnings and stimulate the creation of new viewing choices for consumers. It will go a long way to reduce piracy, but it will not eliminate piracy.

Furthermore, it must be stated at the outset that during the hearing Gary Shapiro of the Consumer Electronics Association misinterpreted the statistics regarding camcording when he stated that 90% of piracy is attributable to camcording in theaters. In reality, statistics show that when a film first appears in pirated form, in 90% of these cases it is from a camcorded source. As the film goes further through the distribution chain, other sources of pirate copies (i.e., DVD copying, etc.) supplant the camcorded versions.

In regards to the harm caused by the analog hole, while estimating the impact of the analog hole calls for some assumptions to be made, a conservative estimate would place it already in the range of $1 – 1.3 billion a year for feature film piracy and at least as much for TV piracy.

As with any illegal activity, estimating the impact of piracy on the movie industry poses some inherent challenges. Illegal enterprises do not report their revenues and profits and people are often reluctant to discuss their illegal behavior. This situation is further compounded when trying to estimate the impact of the analog hole, which is a subset of the more general film piracy problem. While monitoring and/or sampling online and offline pirate offerings can provide valuable information as to the source of the pirate product (e.g. Camcord, DVD, Screeners), they provide very limited information on the way the product was originally obtained (e.g. in the case of DVDs whether the DVD was ripped using a ripping software, such as De-CSS or whether the protections were stripped via the analog hole). As a result, certain educated assumptions have to be made in order to be able to provide an estimate for the financial losses suffered by the movie industry as a result of the analog hole.

Having said that, our findings show the following:

- A notable portion of the industry's losses to piracy is attributable to the analog hole.

- The losses attributable to the analog hole can be reasonably quantified by applying a conservative approach based on empirical evidence and a reasonable research methodology.

- The losses to the U.S. film industry due to the analog hole are already in the range of $1 – 1.3 billion annually, NOT including losses due to piracy of TV programs. The losses due to TV piracy most likely equal or exceed that range.

The impact of film piracy on the movie industry has been quantified in numerous studies, most notably by the recently-published, MPA commissioned, study by LEK, which is by far the most robust, extensive and exhaustive piece of research on the topic ever conducted. Indeed, the LEK study was audited and the results verified by a well-respected research institution, Economist, Inc. prior to being released. Starting from the overall piracy estimates provided in said study, we provide the below analysis to identify the estimated portion of these losses attributable to the analog hole.

The LEK study included a total of 18,600 phone, Internet and face-to-face interviews conducted in 22 territories, as well as 15 focus groups conducted in 6 territories. Respondents were asked about their pirate behavior and their legitimate purchasing behavior (both current and in the hypothetical case had they not pirated) and therefore reflects actual substitution rates and provides a conservative estimate of the overall impact of piracy.

The LEK study found that $6.1 billion was lost in 2005 by the major U.S. motion picture studios to worldwide piracy of feature film content. The break-down of the sources of such piracy is as follows:

- $1.3B due to consumer copying of copy-protected content
- $2.3B due to online piracy
- $2.4B due to bootlegging (i.e., commercial sales of pirated hard copies)

While 100% of the first category is obtained from copy-protected content, this is not the case for the second and third categories. Many bootlegs and files obtained from file-sharing networks originate from camcords or scans of a film print and therefore should be excluded from the analog hole discussion. A sample of 49 titles traded online reveals the following sources (these sources are equally attributable to bootlegs, as these are typically manufactured using sources obtained online):

1. 36% of content is sourced to camcorded copies
2. 11% is sourced to a scan of a used film print
3. 37% is sourced to DVDs
4. 13% is sourced to Screeners
5. 3% is sourced to PPV (Pay-Per-View) sources

While the analog hole is irrelevant to the first two sources (camcords and copies from film print scans), it does come into play in the case of the three others, as follows:

- DVDs / Copying of Copy-Protected Content: DVDs can be either "ripped" using a ripping software package to circumvent the CSS protection of a DVD, or they can be copied by exploiting the analog hole. Software that circumvents the CSS protection of a DVD was ruled by the federal courts to be illegal under the DMCA anti-circumvention provisions and is not carried by legitimate retailers. However, similar software programs can be downloaded from the Internet and therefore likely account for a substantial percentage of pirated DVD copies.

  It is worth noting that certain anti-ripping software has been developed, which is able to interfere with the ability of many of today's illegal ripping programs to make digital rips. Companies such as Philips, Macrovision and others have made such anti-ripping software available. This software has been experimentally deployed on a number of DVD releases. Nevertheless, a copy of the DVD protected by anti-ripping software—presumed to have been made from the analog hole—appeared on-line with the same speed as other similar DVD titles that were not protected by such anti-ripping software. This demonstrates two very important facts: First, even if a significant percentage of unauthorized copying of DVDs occurs today through the use of digital ripping tools, if the efficacy of such tools is effectively eliminated then copying through the analog hole and uploading to the Internet will seamlessly fill the gap. Second, because anti-ripping software and tools may deter direct digital rips, employing the analog hole stands as the most reliable avenue to unauthorized copying and redistributing of DVD content.

  Clearly, illegal ripping software does not account for 100% of all unauthorized copies of DVD content. Devices exploiting the analog hole are regularly used to copy copyrighted film content from DVDs. Furthermore, unlike ripping software which is illegal, these analog hole devices are legal and widely available legitimately from both "brick and mortar" and online retailers. We note that at present it is not technically feasible to analyze an illegitimate copy of a film taken from a DVD and posted online to determine reliably whether that illegitimate copy was made using ripping software or made by exploiting the analog hole.

  As noted above, film titles on DVD that are protected by anti-ripping software are still uploaded to the Internet via the analog hole. Therefore, one can easily conclude that if direct digital ripping of DVDs by the use of circumvention devices was eliminated, then use of the analog hole would supplant the use of such circumvention devices and the losses due to unauthorized copying of DVD would be 100% attributable to the analog hole. The figures below are based upon the very conservative assumption that 20-30% of DVD copying today is attributable to the analog hole.

- Screener Sources: Screeners are DVDs or VHS tapes that are sent to retailers and to media in order to promote sales of new titles or to members of motion picture

trade academies and guilds during awards season for their consideration. We estimate that 30% of all Screeners are VHS tapes, in which case the content invariably passes through the analog outputs of the devices (as VCRs are analog devices), so it can safely be stated that 100% of these Screeners are attributable to the analog hole. The remaining 70% of Screeners are DVDs and therefore the same logic as above applies, and we assume that 20 – 30% of the copies sourced to these Screeners are attributable to the analog hole.

- PPV Sources: Pay-per-view is typically delivered via cable or satellite services. Distribution contracts with such cable and satellite distributors generally require that digital outputs of set top boxes must be protected with encryption when transmitting pay-per-view content. Therefore, we conclude that nearly all unauthorized copies that are sourced to pay-per-view occur through use of the analog hole and attribute 90% of such copying to the analog hole.

Applying the above assumptions to the available data, we come up with an estimate of between $1 – 1.3 billion of losses attributable to the analog hole, as follows:

	Base Piracy Loss Estimate	% Attributable to Source	% Attributable to Format	% Attributable to Analog Hole		Piracy Losses Attributable to Analog Hole	
				Scenario I	Scenario II	Scenario I	Scenario II
Copying of copy-protected content	$1,363	100%	100%	20%	30%	$273	$409
DVD sources	$4,713	37%	100%	20%	30%	$349	$523
VHS Screener Sources	$4,713	13%	30%	100%	100%	$184	$184
DVD Screener Sources	$4,713	13%	70%	20%	30%	$86	$129
VHS PPV Sources	$4,713	3%	30%	100%	100%	$42	$42
DVD PPV Sources	$4,713	3%	70%	20%	30%	$20	$30
Total	**$6,076**					**$953**	**$1,317**

If left unaddressed, abuse of the analog hole will continue to provide those who choose to avoid content protection measures and ignore the distinctions among various content offerings (e.g., rental vs. sale) an easy way to do so. The result of leaving the analog hole unchecked will continue to contribute to industry losses and negatively affect its ability to roll out rapidly new service offerings to consumers. The film and television industry brings to the U.S. economy a positive balance of trade with all countries, except China. As a result, ensuring that this industry can continue to produce and distribute its works and protecting it from losses due to piracy are clearly in the national interest.

2. **Although your written statement indicates that "narrowly focused and targeted legislation is required to implement an analog hole solution", opponents of the MPAA-supported legislation have argued that its scope extends beyond products that could be used to copy movies. Some examples from the Consumer Electronics Association include medical devices, airplanes and measuring equipment. What products should the legislation cover in order to effectively address your industry's concerns?**

The legislation will apply only to devices that are capable of processing or converting into digital form analog video signals in specific formats commonly used for commercial audiovisual content. It would not regulate analog connections generally or all analog to digital converters. So, for example, it would not regulate printers, automobiles, medical devices, airplanes, measurement equipment and the like. The scope of the legislation is intentionally narrowly focused.

If one accepts the premise that content owners should be encouraged to release digital content in new ways and embrace new business models enabled by digital rights management (DRM), such as video-on-demand or pay-per-view streaming, then it must follow that the usage rules associated with such content are maintained and respected as the content is converted from secure digital form to "in the clear" analog signals and back to digital. If such usage rules are not maintained and respected, it will become impossible for our industry to offer the kinds of options and choices for which our customers have been asking. This legislative approach aims to help our industry provide consumers with the choices they want by protecting the usage rules that enable those choices. That is all the legislation seeks to accomplish.

Only devices that take in analog video content and convert it into digital form would fall within the scope of the legislation. Such devices include DVD recorders with analog inputs and PVRs with analog inputs and the like. In regards to computers and related equipment, the legislation is narrowly crafted and would apply only to those computer products that can take in an analog video signal in specific formats that are commonly used for commercial audiovisual content and convert it into digital form. Only a small minority of computers include analog video inputs compared to the number of computers sold overall. For example, very few laptops or notebook computers are sold with analog video inputs. Most business desktop computers do not include analog video inputs. Generally it will be media center personal computers that are configured with inputs to receive and digitize analog video signals. And even in the case of media center type PCs, it is only the video capture cards and associated software that are covered by the legislation, not the general purpose components (either hardware or software).

3. **Mr. Glickman, your written testimony states that the legislation introduced in the House "reflects multi-industry talks and is consistent with the consensus that came out of that process." But it has come to my attention that there is considerable opposition to that legislation from the very**

stakeholders that participated in those talks. Can you elaborate on the "consensus" that came out of your multi-industry talks?

The Analog Reconversion Discussion Group (ARDG) was formed with the goal of exploring technologies that might address analog reconversion of digital content (i.e., the analog hole). The meetings were co-chaired by Michael Epstein (Philips Electronics N.A. Corp), Andy Moss (Microsoft Corporation) and Spencer Stephens (Warner Bros).

The ARDG reached a consensus that the analog hole is a problem that needs to be addressed and agreed on the attributes that a solution should have. As was the case with the Broadcast Flag consensus, there is disagreement on the details of how a solution should be implemented. Just as the Broadcast Flag disagreements were resolved by the FCC in its rulemaking process, disagreements regarding a solution to the Analog Hole should be resolved in the context of the administrative process established by HR 4569, the Digital Transition Content Security Act. While the FCC's Broadcast Flag rulemaking process dealt with many contentious issues and no single party got everything they wanted, at the end of the process all parties walked away generally satisfied. The result was a fair and workable compromise. We believe the analog hole solution can be implemented through the same kind of process and that it will produce a similarly fair result.

While there may be differences of opinion regarding how a solution should be implemented, there is consensus that the analog hole needs to be fixed. Thus, there is no justification for doing nothing.

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July 21, 2006

The Honorable Arlen Specter
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Committee On The Judiciary
224 Senate Dirksen Office Bldg.
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Dear Chairman Specter:

I greatly appreciated the opportunity to participate, on behalf of the Consumer Electronics Association and the Home Recording Rights Coalition, in the Committee's June 21 hearing regarding "The Analog Hole: Can Congress Protect Copyright and Promote Innovation?" Please find attached, in response to your June 29 letter, my answers on behalf of CEA and the HRRC to the additional written questions from Committee members as forwarded with your letter of June 29.

I am proud of our long record of cooperation with your Committee and its members and staff. We continue to look forward to opportunities to be of service to the Committee.

Sincerely,

Gary Shapiro
President and CEO

Answers of Gary Shapiro
July 21, 2006

Senator Specter
Questions for Gary Shapiro
President and CEO
Consumer Electronics Association

1. *Mr. Shapiro, your written testimony takes issue with the mandated technologies in the proposed House bill. Does the problem lie with the fact that technology is mandated or with the specific type of technology mandated? If it is with the type of technology mandated, are there alternative technologies that your industry would endorse?*

The problem lies essentially with the feasibility of trying to solve the technical problem by means of passive encoding through technologies such as these, rather than with the technologies themselves -- though there are issues about them as well. Use of passive encoding requires a legislated mandate to compel conformance in a wide range of components and devices. This appears impractical and potentially very distortive of markets.

We do not doubt that the technologies put forward in House bill represent some of the best available technological approaches, and that the private sector advocates of this approach are supporting these solutions in good faith. The problem is that, even if these technologies could be certified as *the* best ones available, they still seem inadequate, because of what is being demanded of them. Since it is not feasible to encrypt analog outputs (which would strand hundreds of millions of analog TVs and VCRs), these technologies are put forward as passive "codes" that would have to affirmatively be sought out, read, and correctly interpreted in *any* device capable of digitizing the analog signal and thus producing a TV picture. This task is so daunting that, after a decade of study and debate, the advocates of such legislation have not even settled on the minimum "format" (resolution) of the picture they would want to protect.

As to the technologies, CGMS-A is in wide use on a voluntary basis, often as a license obligation. A problem with mandating universal reliance on it, however, arises from the fact that it cannot be used in a common (VGA) analog interface. VEIL is also one of nine technologies presented to the Analog Reconversion Discussion Group ("ARDG," see discussion below). It is, however, a proprietary technology that can only be evaluated after signing an NDA and payment of $10,000. It has been tested by one industry but the results of the tests are largely secret. The normal adoption process for technology standards requires evaluation and testing of multiple alternatives and full disclosure of technical details and licensing terms and conditions.

2. *Mr. Shapiro, your written testimony notes that the working group that your association participated in with the content owners left your industry with many questions regarding how to address the so-called analog hole issue. Can you elaborate on this?*

The working group referred to, the "ARDG" ("Analog Reconversion Discussion Group") was a subgroup of the Copy Protection Technical Working Group ("CPTWG"). CPTWG is an open forum. Though it is organized and jointly chaired by consumer electronics, information technology, and motion picture groups (the recording industry withdrew from participation several years ago), it is open to anyone with a professional or consumer group interest in the discussions. Hence, neither CPTWG nor subgroups such as ARDG are equipped to be decision-making bodies in the sense of advocating some technologies and discarding others.

In the past, CPTWG subgroups and work groups have sponsored comparative testing, and made the results publicly available. In the case of ARDG, however, the consensus task was to gather and discuss specific representations made by those who favored particular approaches to such encoding, and to compile this data on a validated side-by-side basis. It was not a task of the group to address under what circumstances devices might be obliged to respond to such data, though there were discussions of the feasibility and reliability of identifying and responding to any such data.

The output of the ARDG -- a final report describing a comparative matrix – was consistent with its mission. There have been other discussions not undertaken as CPTWG subgroups, but these did not extend to the point of formulating legislative approaches.

3. *Mr. Shapiro, you discuss the burden that a proposed government mandated solution would impose on the innovation industry. But doesn't the consumer electronics industry bear the burden of addressing the problem that it arguably created?*

We remain stuck for the foreseeable future with analog eyes and ears, though we are moving to do all of our external processing by digital means. Conversion back to analog, at some point, remains essential in order to enjoy the products of the entertainment industry. So, any argument that the consumer electronics industry "created" a problem by popularizing television and recording devices would seem misguided – first, because there should be nothing to apologize for, and second, because the issue is much more fundamental. Television and recording technology were invented and popularized via analog radio and recording techniques that served society well throughout the twentieth century. In the 1980s and 1990s, digital techniques became increasingly common, and soon will prevail. The consumer electronics industry reflects this trend, is proud of the role it has played in it, but cannot claim to have "caused" it. The underlying cause is the march of technology.

The consumer electronics industry reflects this transition, but neither caused it nor complains about it. Every industry, including the entertainment industry and our own, foresees problems caused by technological change. The question is whether the perception of a problem is sufficient to impose additional problems on the marketplace and the public at large. No case has been made that there is any need to do so. Nor has any case been made that by popularizing analog televisions and recorders, and then by popularizing digital TV and recorders, and the Internet, the consumer electronics and information technology industries bear some "blame," such that their customers should now receive products that are more expensive and work less well. Yet the entire cost, compliance burden, and potential liability flowing from the mandate on components, products, and possibly software would fall on these industries, while the content community arguably derives whatever benefit there might be to such a mandate.

We do not believe that the consumer electronics or information technology industries "owe" the entertainment industry anything for developing television, recording, computer, and Internet technology. If anything, the reverse is true. But we are committed to continuing to work collaboratively to enrich the lives of consumers with new content, technology, and products.

4. *Mr. Shapiro, have your or any of your member companies conducted tests to estimate how much implementing the mandated technologies would cost your industry? If so, can you share that information with the Committee?*

It has been impossible to even envisage any such tests because even the most detailed legislative proposals, such as the House bill, have left key definitions and determinations to be arrived at *after* the enactment of legislation, by the Patent & Trademark Office. Hence, it is not possible even to begin to define the products and software that would need to be altered, individually or (potentially) in combination. Nor is it possible to know how courts would interpret such a law, once the first "gray area" product or component became the subject of litigation.

A "cost" of any such law must include (1) the cost to manufacturers, retailers, and investors for reserves to cover possible damages if the law is interpreted by the courts as being broader in scope than anticipated, (2) potential liability to consumers for unintended consequences (*e.g.*, "false positives") of implementing the technology, and (3) the costs to society of keeping useful products off the market, due to concern over such costs, or making them more expensive.

5. *Can you tell us how the consumer electronics industry would react to a straight sunset of analog outputs?*

A straight sunset of analog outputs would be grossly impractical and unfair to the hundreds of millions of consumers who rely on devices with only analog *inputs*. The effect of such a sunset would likely be much more severe, and widespread, than will be the termination of over-the-air analog broadcasting: whereas fewer than 10 percent of all homes rely on over-air analog TV transmissions; *most* homes rely on the *analog* inputs

from digital cable and satellite boxes to provide signals to their TVs, and even to digital recorders such as a TiVo PVR.

The only context in which a phaseout of analog *outputs* could be considered fair or feasible would be if there were, first, a phaseout of sole reliance on analog *inputs* in display and recording devices. (The reference here is *not* to the analog tuners, which are close to being phased out; it is to the "video" input to the display itself.) Many display and recording products, with service lives projected to extend over a decade, have only such analog "video" inputs. This is particularly true of recording products, as to which secure digital input technology that supports home recording is available but has not been broadly licensed by the entertainment industry, or adequately supported by the cable and satellite industries.

6. *CEA has said in the past that there is, in fact, a need for legislation to address the analog hole. If not the Sensenbrenner legislation, then what would you do to fix the analog hole?*

This is not what CEA or the Home Recording Rights Coalition has said. HRRC (of which I am Chairman) has said that analog hole legislation, *under certain circumstances and subject to specific requirements,* could be considered preferable to other measures advocated, at times, by the entertainment industry:

(1) "Selectable Output Control," by which content providers would code signals so as arbitrarily to *turn off* the consumer product outputs they do not favor, leaving law-abiding consumers owning less favored devices with a dark screen, and

(2) "Downresolution," whereby HDTV content has ¾ of the pixel information removed out of concern that it might be copied.

HRRC has said that *if* some measure is deemed necessary, an "analog hole" approach would be less objectionable than such measures, and in such case HRRC would work with other interests to discuss such an approach, *provided* –

(1) The mandate would be of a known, consensus technology.

(2) Technological progress would not be impaired, and

(3) Consumer rights and expectations are protected through "encoding rules" that protect their rights flexibly to search, index, store, and select for play back content that is lawfully acquired and recorded at home for private, noncommercial purposes.

Though CEA and HRRC acknowledge that, ideally, content providers would like to attach a single set of "rules" to digital and analog in-home use of content, neither CEA nor HRRC has acknowledged that a "problem" exists so as justify the imposition of the measures referred to above, or of an "analog hole" mandate. Moreover, our testimony

demonstrated that the technologies and draft legislation offered to date do not satisfy the first two prerequisites listed immediately above. In addition, in light of our recent and ongoing experience with the new demands by the recording industry to control consumer "playback" of content whose recording is legally protected, the "encoding rules" offered in draft legislation appear insufficient as well, as they do not guarantee to consumers the right to control playback selection of the recordings that they lawfully make and store.

7. *How have you concluded that the analog hole is not the source of significant piracy? Do you have any technical proof to that effect?*

Piracy is the mass dissemination of content in commercial competition with the rights owner. It is well documented that the main *sources* of piracy are (1) motion picture prints obtained via bribery or pilferage, and (2) camcorder use in motion picture theaters. The former is being addressed by the motion picture industry through tighter practices; the latter through enactment of more specific state laws – a task in which we have cooperated with the motion picture industry in drafting uniform legislation.

There is no evidence that recording via the digitization of analog outputs contributes to piracy, and there is evidence that it does *not*: the facts, cited by motion picture representatives, that most pirated movies appear on the Internet *while or before* they are in theaters -- long *before* they ever reach a consumer electronics device of any sort. Once in Internet circulation, the movies can be duplicated via entirely digital network techniques that involve neither consumer electronics home recorders or analog interfaces.

8. *You state that the proposed legislation is the broadest technical mandate ever proposed. Can you suggest an alternative approach for solving the analog hole that would involve a narrower mandate?*

At present it is not possible to say how "broad" or "narrow" the mandate in the proposed legislation would be, because key terms and provisions would be left for future determination by the PTO. Assuming, however, that such an ideal can be identified, and that it would be too "broad" to be acceptable, "narrowing" the mandate to be less than ideal would cause its own unacceptable problems. The presentation by Dr. Cole of Texas Instruments, attached to my testimony, demonstrated that a "narrower" mandate would cause uncertainty and market disruption while not allowing the purported problem to be addressed effectively. Inevitably, components, devices, and software left out of the mandate would become popular, and hence litigation targets by content providers claiming that the purpose of marketing such components, devices, or software is to "circumvent" the legislation. This dilemma is probably one of the reasons that, rather than define all of its terms, the draft legislation punts the problem to the PTO.

9. *You say that VEIL is too costly and untested. If testing proves that Veil proves approximately 1 to 2 cents per device to implement, would this be an acceptable price for the CE industry? Given the third party testing that has already been conducted on Veil technology, what additional testing do you think is necessary to make it acceptable?*

The MPAA's estimate of 1 to 2 cents per device (i.e., a "chip") is greatly understated, and does not include the costs of redesigning each of the many devices in the market.

There are a number of reasons why the estimate of 1 to 2 cents per device is understated:

a. The 1 to 2 cent figure is based on the estimated complexity of a theoretical design that may or may not have been implemented and tested.
b. That design is presumed to be an analog design and may not represent the best or cheapest way to implement VEIL decoding in a device that contains a significant amount of digital logic.
c. That design may be incompatible with the architecture of existing devices or with the process by which they are manufactured.
d. Whether or not the VEIL decoder design requires external passive components is unknown. The cost of such components can easily exceed the cost of the VEIL decoding logic on the device.
e. When a device is redesigned a new set of photolithographic masks must be made for the entire device. Depending on the chip, cost of a mask set can range from several hundred thousand dollars to several million dollars.
f. The figure does not include the cost of testing to assure correct operation and compliance and the additional administrative costs of a technology mandate with significant accompanying liability.
g. The scope of implementation, and the circumstances in which an implementation in software would be demanded, are yet undefined.
h. That cost also does not include the unknown costs that may be imposed by intellectual property licenses for the VEIL technology itself and for any third parties that may lay claim to owning patents implicated by the VEIL technology or by the mandated implementation—unknown costs that can be both unexpected and substantial, as the CE industry learned following the mandate for the "V-Chip."

There is a useful analogy in the automotive industry. The average cost of a new car is on the order of $10 per pound, e.g. $30K for a 3000-pound car. Suppose a new safety or anti-pollution device is mandated that weighs one pound. The device may contain complex electronics and may itself cost far more than $10. In addition, the car must be modified to accept the device, and the modified car must be tested. The device brings with it additional costs for manufacture and testing, costs for warranty repairs, and

additional liability. And, if cars were made like chips, a completely new set of plans for the entire car would have to be generated. The additional cost will be many times greater than $10.

The United States and much of the rest of the world are in the midst of a transition from analog to digital television. The semiconductor companies that make TV decoders and video analog to digital converters will be engaged in designing and manufacturing devices to support this transition, including tens of millions of converter boxes for Americans with analog TVs. A mandate that covers TV decoders and similar devices is likely to slow the DTV transition, because there are a limited number of people with the skills needed to design such devices. Their skills would best be spent on designing new devices to hasten the transition.

July 20, 2006

The Honorable Arlen Specter
Chairman
United States Senate
Committee on the Judiciary
224 Dirksen Senate Office Building
Washington, DC 20510

Dear Chairman Specter,

Thank you for the opportunity to testify at the United States Judiciary Committee hearing regarding "The Analog Hole: Can Congress Protect Copyright and Promote Innovation?" on June 21, 2006.

Attached to this letter are written responses to your questions dated June 29, 2006. I appreciate the opportunity to address these important questions.

Thank you, again, for the opportunity to participate and bring a consumer perspective to the debate. I look forward to working with the committee on these issues in the future.

Sincerely,

Gigi Sohn
President

The Public's Voice in the Digital Age

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Questions and Responses:

Question 1:

Ms. Sohn, in your testimony, you argue that the solution to piracy lies not in preventing the initial creation of unauthorized copies, but in the stronger enforcement efforts to shut down the digital market for pirated copies. Do you have any particular recommendation on how to strengthen existing enforcement efforts to combat piracy?

Response:

There are three aspects of your question that I would like to address. First, "unauthorized copies" are not necessarily unlawful under copyright law, and as such, they are not something Congress should prevent entirely. As you know, for critique, commentary, news reporting, and education, copyright law sets out a limitation on the rights of copyright holders called fair use. Much like free speech, fair use is a critical aspect of what makes United States law different from most other nations in the world. If authorization was needed to critique or comment on one's work, much, if any, of the public discourse and freedoms that this nation was founded on would not be possible, as they surely would be "unauthorized."

Second, your question assumes that there is significant piracy due to the so-called "analog hole." Indeed Mr. Chairman, when you asked the Motion Picture Association of America (MPAA) for specific numbers on the amount of piracy that was caused by analog outs on consumer devices, Secretary Glickman could not give you an answer. Clearly you were skeptical, as was I, of the study he put forth claiming multi-billion dollar losses to the content industry due to non-commercial consumer copying. Unfortunately, this study is private and has not undergone any public scrutiny and in any event, Mr. Glickman did not even purport to claim that most or even some of this consumer copying derived from use of the analog hole. Adding the study to the public record would go a long way to understanding the MPAA's claimed problem and evaluating their proposed solution. Additionally, any potential "piracy" facilitated by analog outs must be balanced against their countless legal uses, whether simply to connect consumer devices, or to record and post critiques of opponents to the web for political discourse.

Third, as mentioned in my original written testimony, the industry has numerous legal tools to combat piracy, several of which they have acquired over the past two years. The *Grokster* decision, *The Family Entertainment and Copyright Act*, and agreements with ISPs to pass on warning notices, are just three recently developed enforcement-type tools that the content industry has in its arsenal. Beyond that, enforcement of traditional copyright law, paired with providing consumers content in new and flexible ways will go a long way to addressing any piracy issue.

Question 2:

Ms. Sohn, in your testimony, you state that time and space shifting of copyrighted material that is currently legal would be restricted if we close the analog hole. However, my understanding of the legislation is that it requires the recognition of copy protections

in the analog to digital conversion process and doesn't actually restrict the use of content. Please explain to me how the legislation would restrict existing technologies.

Response:

It may be true that "the recognition of copy protections in the analog to digital conversion process doesn't actually restrict the use of content." However, that statement is worded in such a way to side-step the true problem that many have with the proposed analog hole legislation. The problem is this: the recognition of the VEIL watermark and the absence of copy protections in the analog to digital conversion process would actually restrict the use of content. The restrictions arise when the CGMS-A content protections are removed, but the VEIL watermark remains intact. Because the CGMS-A copy protections are widely reported not to be robust, they can easily--and even unintentionally--be lost from the analog signal. The VEIL watermarking scheme is reportedly more robust, placing marks in the video that may be visible to the naked eye and more difficult to remove. When an analog hole-compliant device receives a signal that includes the VEIL watermark but not the CGMS+A copy protections, the rules require that the compliant device not even copy the signal.

Moreover, even if the CGMS-A signal remains intact, the technical restrictions imposed by the proposed analog hole rules are stricter than those of copyright law, limiting the ability of citizens and consumers to exercise fair use. For some content, users are restricted to a single copy, which would prevent legal viewing and storing content among a consumer's multiple compliant devices. Some proposals limit time-shifting to ninety minutes and copying altogether for certain content.

Attached to these responses is a graphical presentation that better explains the consumer-based problems caused by the MPAA's analog hole solution, which has been introduced in the House of Representatives. I referred to this presentation at the hearing.

Question 3:

Should consumers be able to use the analog hole to make copies of copyrighted works? If not, what do you think the answer should be to this problem?

Response:

The resounding answer to this question is "Yes." Consumers have long relied on analog outputs to make lawful uses of content they have lawfully acquired--to interconnect consumer electronics, time and space shift their favorite television shows, and critique and comment on news and public affairs.

As noted in my written testimony, the Copyright Office has said, at least in the case of one ***digital*** format (the DVD) that only permitted legal method to make fair use under the Digital Millennium Copyright Act is via analog outputs.

Whether these uses are called fair uses or non-commercial consumer uses, they are what consumers expect and demand from the devices and software they purchase. To minimize and limit consumer these expectations would harm the market not only for new consumer electronics industry, but the content industry as well.

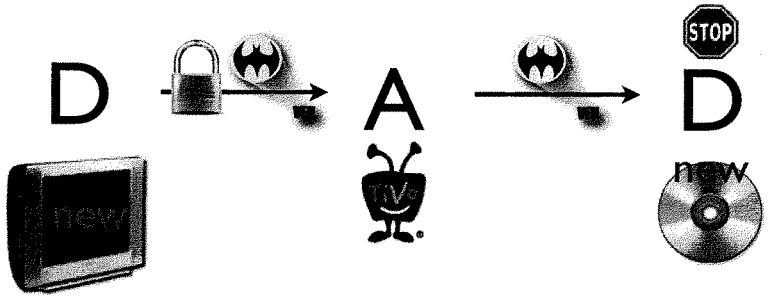
all of the following examples are common and rely on the last device being a new compliant device.

the middle devices are non-compliant, unintentionally "laundering" devices that drop the cgms-a, but manage to pass on the veil watermark.

the first devices in these examples are all compliant devices, but that doesn't really matter, so long as the content itself contains the cgms-a + veil and is otherwise passed along.

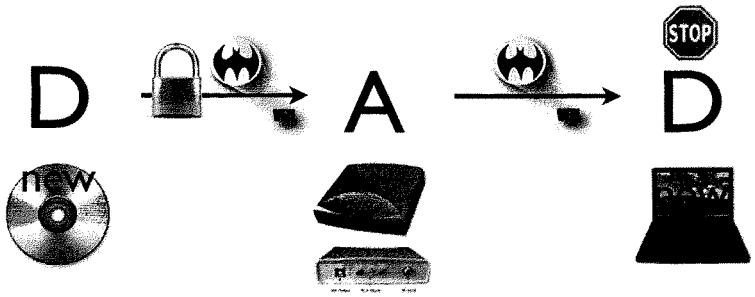
remember, if you are using all old, non-compliant devices, none of this matters (and is a reason why no one may buy new equipment, as it will be less compatible).

example 1: archiving a dvd from your tivo



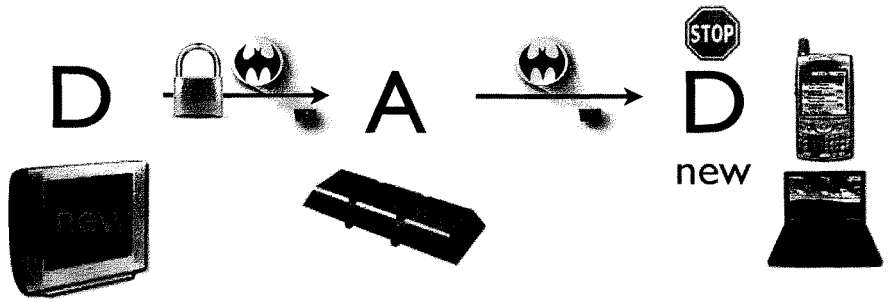
compliant analog tv sends video (cgms-a + veil) to
non-compliant analog tivo.
tivo drops the cgms-a and only sends veil to
a complaint dvd burner.
dvd burner refuses to copy because
video with "only veil" means "no copy."

example 2: dvd excerpt presentation



compliant dvd player sends analog video (cgms-a + veil) to analog video capture device.
capture device drops the cgms-a and only sends veil to a complaint laptop.
laptop software refuses to copy video into powerpoint because
video with "only veil" means "no copy."

example 3: using slingbox



compliant analog tv sends video (cgms-a + veil) to non-compliant analog slingbox.
slingbox drops the cgms-a and only sends veil to a complaint laptop or mobile phone.
mobile phone and laptop refuse to copy because video with "only veil" means "no copy."

July 20, 2006

Mr. Barr Huefner,
Senate Judiciary Committee
224 Dirksen Senate Office Building
Washington, DC 20510

Dear Mr. Huefner,

I am pleased to provide the following answers to the written questions from Senate Judiciary Committee members following the June 21, 2006 hearing entitled "The Analog Hole: Can Congress Protect Copyright and Promote Innovation."

1. Your testimony indicates that technology manufacturers could face implementation costs if the technology mandates in the House bill are enacted. Do you have an estimate of how much it would cost your company to implement the technology mandates in the House bill?

The ultimate implementation costs for TiVo are disquietingly unknown and are a significant part of our concern about any legislative mandate of technology, but particularly of the Motion Picture Association of America's proposed "solution" for the so-called analog hole.

First, this technology may have been deployed in a toy, but it hasn't been deployed in consumer video devices; accordingly, there are no relevant real-world implementation costs to examine. Indeed, we cannot even look at the specifications without paying a fee and signing a nondisclosure agreement that would bar us from commenting on the technology to this Committee.

Second, the MPAA's proposed legislation contemplates future changes to the technology, the impact of which we cannot forecast accurately. That proposal also would establish new authority for a regulatory body – the Patent and Trademark Office – to establish new regulations requiring companies like TiVo to appear and petition for approval of their systems. This is another element to be factored into implementation costs, including the costs associated with potential delays for new products entering the market.

Third, as indicated below in response to your second question, the threat of substantial patent liability is considerable and real.

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Fourth, we cannot estimate the added support costs that would be engendered by the MPAA proposed analog hole "protection" system, as well as potential damage to TiVo's reputation as a user-friendly device when the analog hole technology interferes with consumers' legitimate use of our devices.

Fifth, we cannot know what will happen when the content industry is not satisfied because the VEIL technology is easily defeated, as we know it will be (and as appears to be confirmed by VEIL's own test results). Having established the precedent that it is the government's obligation to "close" the analog hole, what new and expensive consumer control system will the content industry then demand?

Finally, the legislation supported by the MPAA would impose draconian penalties and potential jail terms for failing to meet robustness requirements that are virtually impossible to meet. Under the MPAA's proposed legislation, a manufacturer would be in violation if it failed to protect content against hacking by an experienced hacker using ordinary tools. These penalty costs are also very real, but impossible to calculate with precision.

2. You also indicate that device manufacturers could face unlimited patent infringement liability if forced to comply with the government-mandated technologies in the House bill. Can you elaborate on this point?

One only has to read the general press about cases like *RIM* to understand the potential magnitude of damages of a patent lawsuit. In order to avoid having to turn off its Blackberry system altogether, RIM paid out some $612.5 million! Such a settlement likely would force any small consumer electronics company out of business.[1]

The watermarking field is replete with patents. The forced adoption of a watermarking technology, as a result of government fiat, likely would give patent trolls (not to mention other legitimate companies that hold watermarking patents) a field day to pursue claims against companies that had been forced to adopt the technology. (*See* Charles Cooper, "Have Patent, Will Sue," CNET News.com (July 10, 2006), a copy of which is attached.) Moreover, as the perennial plaintiff in that article admits, defending a patent suit alone can cost upwards of $15

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[1] *See, e.g.*, "Ten Years of Chilled Innovation," BusinessWeek Online, *available at* http://www.businessweek.com/technology/content/jun2005/tc20050629_2928_tc057.htm (last accessed July 11, 2006):

"But a second way to stop the innovation is just to litigate. Look what happened to ReplayTV: It spent years and millions of dollar[s] litigating to defend its right to have the ReplayTV technology as it was. Essentially, it had to fold the company because the legal standard then was so uncertain that you had to get to trial before you could resolve the case."

million. It is unreasonable to ask companies such as TiVo to spend large sums of money to implement an unknown, unvetted technology to "protect" the motion picture companies against, as Mr. Glickman testified, personal copying and giving copies to friends (as opposed to real piracy), and then be asked to shoulder possibly fatal patent litigation.

3. Mr. Cookson has stated in his testimony that it would require nothing more than for you to recognize and flag copyrighted material. Why will the proposed legislation 'put you out of business'? Can you tell us how analog hole legislation would affect your company?

As individuals we are often grateful for the deflection from reality that Hollywood provides in the two hours or so we watch the flickering images on the screen and follow a fictional story line. Unfortunately, in the complex world of delivering those images and sound to consumers, the statement that "it would require nothing more than for you to recognize and flag copyrighted material" is grossly misleading. The MPAA proposal Mr. Cookson supports goes much further. It is not simply *recognizing* and *flagging* copyrighted material. Their legislative proposal would require a complex system of *controlling* and *managing* the consumer's use of the material.

TiVo's justified concern is that the content industry has an intense dislike for any device that empowers consumers to decide where, when, and how they want to view material for which they already have paid (whether directly or indirectly), *i.e.*, for making personal, flexible use of legitimately-acquired content.[2] Mr. Glickman's testimony made clear that his motion picture company members equate personal copying with piracy, even in countries where consumers pay a levy to the content owners to permit copying that US courts might not consider fair use. TiVo rejects the MPAA's philosophy. TiVo's business model consists of empowering consumers to enjoy legitimately-acquired content where, when, and how they wish to enjoy it. We vehemently oppose real piracy; the kind of piracy the MPAA claims costs it some $5 billion per year. Indeed, as I testified, real piracy strikes at the heart of TiVo's business model. We agree with Senator Hatch – the MPAA ought to focus its energy on

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[2] TiVo is not alone in its concern. See the attached recent Los Angeles Times editorial, which states, with respect to five technology bills currently pending before Congress, including the analog hole bill:

> Clearly, the industry-backed proposals would do more than just defend copyrighted works from pirates. They also would impinge on devices that have legitimate uses and steer the development of technology, cutting off some innovation. As they weigh the entertainment industry's pleas, lawmakers shouldn't assume all consumers are bootleggers and every digital device is a hand grenade aimed at Hollywood.

"We aren't All Pirates: Anti-piracy proposals before Congress could limit innovation and legal uses of technology," LA Times (July 10, 2006), *available at* http://www.latimes.com/news/opinion/editorials/la-ed-piracy10jul10,0,2000938.story?coll=la-news-comment-editorials (last accessed July 13, 2006).

reducing real piracy before invading people's homes and asking the government to control citizens' devices.

Of course, as demonstrated before the FCC, TiVo has one of, if not the strongest protection systems to prevent indiscriminate redistribution of copyrighted content. The problem is that our system doesn't interfere with everything Hollywood claims is a copyright violation, *i.e.*, personal copying. In pleadings before the Copyright Office, the content industry has maintained that hundreds of millions of consumers have been violating copyright law by copying entire programs and CDs for personal use.[3] Accordingly, Mr. Cookson is asking TiVo and this Committee to reinterpret the Copyright Act to "protect" the motion picture industry from personal copying regardless of consumer fair use of that material. Again, TiVo does not regard copying for commercial sale (piracy) or indiscriminate redistribution of the content on the Internet as personal copying or permitted by fair use. Those are copyright violations and TiVo already works hard to forestall such acts.

Mr. Cookson's question, however, portends a much darker scenario that will negatively affect not just TiVo, but the entire consumer electronics industry and computer industry. As I noted in my testimony, it implies removing the L from the PLAY button, making it the PAY button. In the attached *Media Daily News* article,[4] a Disney/ABC executive reveals that his company would like to "neuter" the fast forward function of a DVR. Here, under the guise of "respecting their copyrights," it seems as if the MPAA similarly would like to control which programs a user can time and place-shift. TiVo is concerned that analog hole legislation is just one more step in the direction of government enforcement of Hollywood's determination of, where, when, and how consumers may watch programs. Analog hole legislation would "neuter" devices and shut down innovation that would otherwise permit consumers to enjoy legitimately-acquired content in new and innovative ways. As TiVo devices have demonstrated, such innovation actually stimulates consumers to consume legitimately more content, which ultimately benefits content providers.

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[3] The latter is particularly puzzling since Mr. Verrilli – the content industry's lawyer in the *Grokster* Supreme Court case – said:

> And let me clarify something I think is unclear from the amicus briefs. The record companies, my clients, have said, for some time now, and it's been on their Website for some time now, that it's perfectly lawful to take a CD that you've purchased, upload it onto your computer, put it onto your iPod. There is a very, very significant lawful commercial use for that device, going forward.

See Transcript of Oral Arguments in *MGM Studios, Inc. v. Grokster, Ltd.*, No. 04-480, at 11-12 (March 29, 2005).

[4] David Goetzl and Wayne Friedman, "ABC Looks Beyond Upfront to DVR, Commercial Ratings Issues," Media Daily News (July 6, 2006).

4. You have said that copying by consumers in their homes for private use constitutes fair use. Do you believe this is the case for copying of DVDs, pay-per-view movies, and video on demand? If so, what legal authority can you cite to support this belief?

TiVo devices do not permit replication of Content Scramble System (CSS) protected DVDs, protected pay-per-view, or VOD content.[5] But the legislation proposed by the MPAA goes far beyond that; it is a slight of hand for the MPAA to focus on material TiVo already protects. As noted above, the content industry regards ***any*** private copying of ***any*** material to be a violation of the content owners' exclusive rights. They have read out of existence fair use as provided by Section 107 of the Copyright Act.

As the Members of this Committee know, fair use is a critically important factor in the Constitutional balance between rights of citizens and authors. Treatises have been written on the bounds of fair use, and I will not attempt to reproduce them here. It is sufficient to point to *Sony Corp. v. Universal City Studios, Inc.*, 464 U.S. 417 (1984) and *MGM Studios, Inc. v. Grokster, Ltd.*, 125 S. Ct. 2764 (2005) as authority for the proposition that space and time-shifting for personal use are lawful activities under copyright law.

With respect to CSS-protected DVDs, it is clear that it would be a violation of the Digital Millennium Copyright Act to defeat the CSS copy protection measures, despite the fact that sophisticated software to do so is widely available.[6] Moreover, the manufacturer of any device that contains software or hardware licensed by the DVD Copy Control Association is bound by contract not to permit unauthorized outputs or recording. TiVo abides by the law and its licenses and does not permit copying of CSS-protected DVDs. While it may well be a fair use for an individual to make a back-up or space-shifted copy of a DVD, it is unnecessary to address that issue here because TiVo does not permit such copying.

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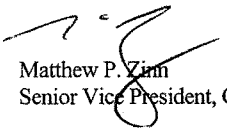
[5] TiVo supports Macrovision. Under the Macrovision license, if a content provider uses Macrovision on PPV or VOD content, copying is limited to a 90 minute cache.

[6] *See, e.g.*, "Copy Your Movies and Music," MaximumPC (April 2006). While TiVo does not condone the use of software such as DVDShrink, as this article demonstrates, software is widely available that makes it easy for any user to copy DVDs entirely in the digital domain. Such software copies DVDs with far more flexibility than using two machines plus an octopus of cables to get an inferior linear copy from the analog output. Accordingly, in considering whether to impose the analog hole technology mandate, this Committee cannot ignore that fact that a search for "DVDShrink" on Google produces 1,380,000 results. This does not even account for such programs that likely also violate the DMCA, but are widely available, such as Nero Recode (1,550,000 results), AnyDVD (3,990,000 results), DVD Decrypter (1,900,000 results), #1 DVD Ripper (only 203,000 results), etc. Thus, whether or not a fair use, as far as preventing copying of DVDs are concerned, any analog hole "solution" is no solution at all.

TiVo appreciates this opportunity to provide the Committee with answers to its post-hearing questions and stands ready to provide any further information the Committee may request.

Sincerely,



Matthew P. Zinn
Senior Vice President, General Counsel, Secretary & Chief Privacy Officer

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Have patent, will sue

By Charles Cooper
http://news.com.com/Have+patent%2C+will+sue/2008-1014_3-6091975.html

Story last modified Mon Jul 10 04:00:10 PDT 2006

Paul Ryan runs what is by most definitions a patent powerhouse--and a controversial one, at that.
As CEO of Acacia Technologies, Ryan is in the business of acquiring and enforcing patents. With the increasing proliferation of Internet technologies, Acacia has rung up the register. Over the years Acacia has patented proprietary its digital media transmission technology to a veritable Who's Who of blue chip tech companies in the streaming media business. It also has patented a technology that lets parents filter television broadcasts according to ratings criteria.

The company's profit potential has helped propel Acacia shares close to their 52-week high, this in an otherwise ragged stock market.

But Acacia's activities have inevitably raised hackles in some quarters of the technology business. The Electronic Frontier Foundation, for instance, has lampooned Acacia on its Web site for "crimes against the public domain" because of what the Internet rights organization terms "laughably broad patents."

No doubt the company has acquired a reputation for hardball tactics, ultimately settling lawsuits against more than 200 companies to protect patents that it says it owns. Ryan, who dismisses suggestions that Acacia is simply in business to extort fees from other companies, recently spoke with CNET News.com.

We ran a profile on your company about a year ago and the lead paragraph was something to the effect that in the streaming media business, a letter from Acacia usually means one thing: the threat of a patent lawsuit. Does it bother you that Acacia has earned that sort of reputation?

Ryan: Well, that's not our reputation among large companies. We recently did three licenses with IBM, three with Sony, we announced one with Intel, and with Lenovo. So, we are licensing the major companies in the world. Patented technologies that we have partnered with the small companies that have developed these patented technologies but simply don't have the scale or the expertise or experience to go out and license the patents themselves. So, we're an outsource patent licensing company. We have the same people in place that IBM's licensing department would--except we're available on an outsource basis, and we're serving a large need for those companies.

I think the patent system has worked pretty well for 200 years.

Would it fair to say that Acacia builds portfolios in order to later extract settlements from others?

Ryan: No. Actually companies come to us who have patented technologies but who simply do not have the scale or the experience to license themselves, and they engage us basically on a partnership basis. We go out and perform that function and split the revenues with them. So, we're not targeting any particular areas, it's the companies that come to us with their patented technologies and if we feel that there's significant opportunity for licensing for that company to generate revenues for them, then we will become their partner.

Pardon me, but there are those who believe that there are entities--they call them patent trolls. This is used as a derogatory adjective, but I'm sure you're familiar with the term.

Ryan: Sure, absolutely.

Do you think those entities exist?

Ryan: Well, there are various definitions. I think it's a little bit disingenuous for companies that, in effect, steal other people's property by not licensing it to then call the party that developed the technology, "the bad guy." It kind of turns the world upside down...The term has been widely disseminated and used against companies generically that own patented technologies, which I think is a little unfair.

You guys are a patent licensing company. I've lost count, you've got currently how many patents now?

Ryan: It's over 150. There's a total of 47 different patent portfolios, and we've begun generating revenues from 17 of those so far.

And how did you acquire them? These aren't things that you've furnished seed money to develop, are they?

Ryan: Some of the original ones were. The television V-chip, we provided the entrepreneurs, we funded the company that developed that technology. But the vast majority of the new partnerships that we're entering into are purely on the basis that we're an outsource licensing company and the developer of that technology then comes to us for us to fulfill that function. So, we are not developing any of the newer technologies that we are licensing.

Let's talk about patent reform. Your thoughts on where things stand and where they should be going?

Ryan: I think the patent system has worked pretty well for 200 years and the court system works very effectively...I think what's really occurred is then whenever companies want to lobby for reforms that would advantage them, first they create a crisis or supposed crisis. I don't think these companies that are proposing these changes all woke up one morning and said, 'Jeez, how can we make the world a better place and make the US patent system better.' I don't think that was their motivation.

What's your suspicion? Is there a particular group behind the scenes that's trying to foster that impression?

Ryan: The lines have been clearly well distinguished. If you look at the eBay amicus briefs, companies like GE and Procter & Gamble, and 3M, and the pharmaceutical industry and those

people who've relied on patents that normally respect other peoples' intellectual property are on one side of the equation. There's a small number of tech companies who have formed some coalitions and ironically they're the same group that has time and time again been convicted in court of willful patent infringement.

Most small companies are intimidated to even attempt to go out and license and assert their patents because they can get tied up in very lengthy, very expensive litigation.

But to play devil's advocate and since they're not here to defend themselves, they might say, "Look, the concept of a licensing focused business such as yours, whose purpose is to extract fees from other growing concerns, that's not good for the technology business and simply stamps out innovation." Your response?

Ryan: Precisely the opposite. It's the patent system that enabled people like Thomas Edison who actually developed the new technologies, which these companies then want to use to make money without paying for. The invention process is critical to the growth of the US economy and it's the smaller companies that usually come up with the new innovations and disruptive technologies that then the larger companies want to adopt. There's no one forcing them to add these features to their products. Obviously, they're doing it because they can make more money using the new features that were patented by someone else.

But the cost of the average court challenge gets up there. I've seen figures quoted at around a million bucks on average. Presumably that would make it pretty tough on small companies that don't have that amount of pocket change. They'd just as soon pay somebody the fee to avoid a nasty court fight, wouldn't they?

Ryan: Most of the issues, again, are quite the opposite. It's usually the small company that's developed the technology and the large company knows that they have far more money and the litigation cost can run far in excess of your estimate. They can run $5 million, $10 million, $15 million. So, most small companies are intimidated to even attempt to go out and license and assert their patents because they can get tied up in very lengthy, very expensive litigation. Many large companies know that and therefore don't take licenses feeling that those companies will not have the financial wherewithal or the staying power to try to assert their intellectual property.

It looks as if patent reform up on Capitol Hill is a dead deal this year. Proponents couldn't get enough votes to get the thing going and it's an election year of course. Do you expect this to become a Washington issue in '07.

Ryan: Absolutely. This debate will continue and both sides will be actively involved in potential Congressional legislation. It will definitely not go away.

http://www.latimes.com/news/opinion/editorials/la-ed-piracy10jul10,0,2000938.story?coll=la-news-comment-editorials
From the Los Angeles Times

EDITORIAL

We aren't all pirates

Anti-piracy proposals before Congress could limit innovation and legal uses of technology.

July 10, 2006

THE INTERNET AND DIGITAL technology have been both a blessing and a curse for the entertainment industry, opening new opportunities for selling music and video but also fueling rampant global piracy.

To attack the latter problem, industry lobbyists are pressing Congress to adopt at least five different proposals that would give them more control over their works as they flow through new digital pipelines into living rooms and portable devices. But these measures, like the technologies they would affect, have a hard time distinguishing between illicit actions and legitimate ones.

The bills would pressure device makers and service providers to limit or eliminate features from some products, such as the ability to record individual songs off satellite radio. In essence, tech companies would have to alter what they are selling to safeguard the entertainment industry's wares.

Protecting intellectual property is a legitimate goal for Congress — after all, the Constitution called on Congress to give authors and inventors exclusive rights "to promote the progress of science and useful arts." The task has grown more urgent with the emergence of an Internet-fueled global information economy. But what the entertainment industry is seeking in this year's proposals isn't merely protection from piracy; it's after increased leverage to protect its business models.

That's why lawmakers must bear in mind the balance needed between copyright holders' interests and the public's, something Congress has not done well lately. In 1998, it gave copyright holders broad power to block legitimate uses of works, even those in the public domain, through the use of electronic locks that impede copying of digital products. And that same year, it prolonged the public domain's starvation diet by extending copyrights an additional 20 years, to 70 years beyond the death of the creator.

The movie and music industries have similar interests, but their agendas this year are distinct. The major studios want to alter digital TV receivers, recorders and home networks to stop shows from being redistributed indiscriminately online — a proposal that has won grudging support from some consumer-electronics and high-tech firms. They also want to redesign computers, set-

top boxes and other products to ensure that the limits placed on digital videos are not removed when the data are converted from digital to analog. This approach could deter people from making a permanent copy of a pay-per-view movie, but it also could make it hard for digital movie buyers to create backup copies or transfer videos to portable players.

The music industry, meanwhile, is focusing its fire on satellite and digital radio services that make it easy for listeners to record and save individual songs. Those recorders don't fuel piracy, given that federal law already requires them to include a form of anti-piracy technology. Instead, a more immediate effect of the industry-backed proposals would be to give labels and music publishers more control over listeners' ability to record broadcasts, while helping them collect more money from XM, Sirius and other digital music businesses.

Clearly, the industry-backed proposals would do more than just defend copyrighted works from pirates. They also would impinge on devices that have legitimate uses and steer the development of technology, cutting off some innovation. As they weigh the entertainment industry's pleas, lawmakers shouldn't assume all consumers are bootleggers and every digital device is a hand grenade aimed at Hollywood.

MEDIA DAILY NEWS

ABC Looks Beyond Upfront To DVR, Commercial Ratings Issues

by David Goetzl and Wayne Friedman, Thursday, Jul 6, 2006 8:45 AM ET
http://publications.mediapost.com/index.cfm?fuseaction=Articles.showArticleHomePage&art_aid=45264

ABC HAS HELD DISCUSSIONS ON the use of technology that would disable the fast-forward button on DVRs, according to ABC President of Advertising Sales Mike Shaw, with the primary goal to allow TV commercials to run as intended.

"I would love it if the MSOs, during the deployment of the new DVRs they're putting out there, would disable the fast-forward [button]," Shaw said.

While MSOs risk losing some of their DVR customers if fast-forwarding were blocked, Shaw said the cable operators--who are beefing up their own local ad sales operations--"are in the same business we're in." "They've got to sell ads too," he said. "So if everybody's skipping everybody's ads, that's not a long-term business model for them either."

Shaw also threw cold water on the idea that neutering the fast-forward option would result in a consumer backlash. He suggested that consumers prefer DVRs for their ability to facilitate on-demand viewing and not ad-zapping--and consumers might warm to the idea that anytime viewing brings with it a tradeoff in the form of unavoidable commercial viewing.

"I'm not so sure that the whole issue really is one of commercial avoidance," Shaw said. "It really is a matter of convenience--so you don't miss your favorite show. And quite frankly, we're just training a new generation of viewers to skip commercials because they can. I'm not sure that the driving reason to get a DVR in the first place is just to skip commercials. I don't fundamentally believe that. People can understand in order to have convenience and on-demand (options), that you can't skip commercials."

Shaw said it's crucial for ABC and networks to hold these discussions with MSOs while DVR penetration is still in its early stages. DVRs are at around 10 percent of U.S. TV households. "It's in our interest and the MSOs' interest to figure out something that works for the two of us," he said.

The frequently outspoken Shaw made his comments Wednesday in a post-upfront interview where he offered up another round of no-nonsense commentary.

Looking back on the protracted upfront, Shaw said he was surprised that competitors at CBS and Fox were so quick to fold the tent and accept buyers' refusals to pay for increased ratings generated from DVR viewing. Shaw had argued earlier in the spring that the ratings jumps--which have reached double-digit percentages for top shows--had value, and he intended to charge for them. He continued that position early in the upfront until it became clear the two other networks weren't willing to hold the line, and had agreed to negotiate on "live" ratings only.

"I'm sure they told their upper management in their two companies why it wasn't a good idea for them to do so," Shaw said. "They and their management must have decided that the same thing we thought was important wasn't important."

Shaw said if he knew he'd be the lone proponent for negotiating on time-shifted ratings, he might have changed course. "Obviously, going back to last February, if I knew nobody else on the entire sell-side of the equation was going to open their mouths besides us, I don't know if we would have gone down the same track," he said.

Some research executives--even at networks with sales departments that acted differently--had argued before the upfront that ads viewed in fast-forward mode generated value for advertisers, since consumers were at least partly exposed to their messages. But Shaw said ABC was only interested in finding a way to receive compensation for un-skipped ads.

ABC's upscale audience, coupled with a strong performance in "A" counties and in leading markets, made his network a must-buy. "If you were looking for those attributes, with the programming on ABC that we deliver, are you going to move those dollars to CBS?" he said. "It doesn't make sense."

No shrinking violet, Shaw is the only sales chief at a major network to speak to the media as part of an upfront postmortem.

As questions fade about whether to negotiate solely on DVR ratings, Shaw said ABC will move aggressively to make deals based on Nielsen's new "commercial ratings," set to be unveiled at the start of the new season. He said ABC was interested in possibly using them as a currency in this upfront, but buyers felt implementing the logistics in such an abbreviated time period wasn't feasible. "We were too late in bringing that to the market for practical reasons," Shaw said. But, he added, "it's going to transform how people buy and plan television."

But Shaw said ABC executives will be fanning out to agencies and advertisers over the next two weeks to present an analysis of commercial ratings data from the last six months, which presents ABC in a favorable light. He added that some scatter business may be written based on the new ratings.

SUBMISSIONS FOR THE RECORD

STATEMENT OF

LeVar Burton
On Behalf of the Directors Guild of America

Before the

Senate Judiciary Committee

Hearing on

"The Analog Hole: Can Congress Protect Copyright and Promote Innovation?"

June 21, 2006
Washington, DC

Chairman Specter, Ranking Member Leahy and Committee members, my name is LeVar Burton and I thank you for inviting me to appear before you today to discuss the problem posed by the technology gap known as the analog hole and its impact on the creative community.

I am here today on behalf of the Directors Guild of America (DGA), of which I am a National Board member. I know there are others testifying who will speak to the technical and related issues on the analog hole. I hope today I can provide the "voice" for those of us who make films and televisions programs and who are directly impacted by the kind of piracy the analog hole makes possible.

Founded in 1936 by the most prominent directors of the period (including King Vidor, John Ford, and Howard Hawks), the Directors Guild today represents over 13,500 directors and members of the directorial team who work in feature film, television, commercials, documentaries and news. The DGA's mission is to protect the economic and creative rights of directors and the directorial team — working to advance our artistic freedom and ensure fair compensation for our work.

Film is truly an indigenous American art form, and the work of filmmakers — in collaboration with other creative artists in our industry – has documented, reflected upon and portrayed the American experience for almost 100 years. Motion pictures played a very unique role in popular culture during the 20th Century — and they continue to be enjoyed daily by billions of people around the world. Those of us who work in film feel lucky and privileged to earn our living contributing our talents to a craft we love.

The process that goes into making a film is understandably unknown to those outside our industry. During the making of a film, directors are actually running a multi-million dollar business—a business involving hundreds of people and a myriad of details and decisions that have to made each day to keep the production on schedule and on budget. Whether it is the crafting of a single scene or the visual creation of a character from the written page, the director is always working to tell the story. This is not an effort we take lightly—it is not uncommon for a director to put years of work into one production.

It is exactly because of what we do that I am here today. DGA places the highest priority on the prevention of widespread pirating of movies, television programs and other creative works. Indeed, the entire film production industry – from studios, to independent production companies, directors, writers, actors, and the tens of thousands of below-the-line workers, both skilled and unskilled – has a tremendous stake in the ever-growing problem of piracy.

One handicap our industry—and directors who work in it—face when we discuss piracy is a fundamental lack of understanding of who we really are. It is an attitude born out of "People magazine"-like stories and the box office receipts which every paper in the country now seems to publish. When the film industry is mentioned, what first and

foremost comes to people's mind is the popular image of the glitz, glamour, and wealth of Hollywood.

The reality, however, is very different. Yes, our industry is concentrated in Los Angeles and New York, but in fact the film industry exists in every state in the country. Yes, there are some stars known the world over who are fabulously wealthy. But in fact, most of the directors and others who work in our industry are unknown to the public. We work behind the camera. And the overwhelming majority of jobs in our industry are held by what we call "below-the-line" workers – the people whose names scroll by at the conclusion of a film – including such jobs as set designers, carpenters, sound technicians, set painters, drivers, foley artists, lighting technicians, make-up artists, seamstresses, and so many other jobs, often amounting to hundreds of workers on a film. They are no different than workers in other industries whose jobs are understandably important to Members of Congress.

And those are just the employees of the production company. The filming of a movie and a TV program also generates substantial employment for scores of small businesses that provide supporting services and equipment for the filming of a movie – from highly skilled computer technicians and artists at special effects companies, to caterers, dry cleaners, security personnel, and others who work for companies that support film production.

Films and television shows are not created by the snap of a finger; nor do they materialize out of thin air. For directors, writers, actors and the many craftspeople we work with, film and television production involves years of creative effort and hard work to put a vision on the screen. For the studios and investors it involves tens, if not hundreds, of millions of dollars to make that vision a reality. Today, the average studio film costs nearly $100 million to make and market.

This involves high risk for almost everyone involved, and it means that it is never easy to get a film financed – a reality faced by everyone who is in this business. Consider that many films do not retrieve their investment from theatrical exhibition.

Almost all films made for theatrical release require large capital investments—and these are highly risky investments since the return can not be known at the outset. Yet today, theatrical receipts account for less than 20% of the revenue received from studio films. That means sales in ancillary markets – from DVD sales, and pay and free television which are most at risk from unauthorized copying – are critical if films are to recoup their investment. Quite simply, without the revenue from those ancillary sales, many pictures would not get made today.

When film and television producers make money, the revenue can be put back into new productions that enable us, as directors, to create that film or television show. And our ability to do that in turn both employs many people and generates income not only for our industry, but also for the U.S. economy. Clearly, the willingness and capacity of producers to invest in film and digital television is undermined when our creative works

are illegally copied, whether in analog or digital form, by casual users or mass produced production facilities, over the Internet or by hard disc. When a greater share of potential income is siphoned off – stolen as a result of piracy – risk rises, financing becomes more difficult, we are not able to make our films … and American jobs are lost.

For directors and the DGA, this is the fundamental concern with piracy: that the siphoning off of revenue from ancillary markets will result in fewer films being made which means less opportunity for us, as creators, to make films and television shows for the public.

Another concern is the effect that unauthorized use of our products has on our income and on our pension and health plans—a situation that is true for not only directors but also others who work in our industry. Our livelihoods are inextricably tied to what happens to our work after the first time it is shown in the theatres or seen on television.

That is because a significant portion of our compensation depends on residual payments. These are the fees paid for the reuse of motion pictures or television productions on free and pay television, and DVD and videocassette, in both the domestic and international markets. When movies and television programming earn revenues in these markets, a portion of that income is shared among the DGA members who work on that production.

My and my fellow directors' economic and creative rights are dependent on this premise – that our work will be protected from copyright infringement – whether from unauthorized editing of our work, or unauthorized copying and reuse that erodes residual revenues.

Why does this matter, you might ask? The importance of residual payments flows from the basic economic underpinnings of our business. The motion picture and television industry operates on the concept of freelance employment, meaning that our members are hired by a variety of different employers on a production-by-production basis. In other words, our members cannot count on a regular paycheck. What they can count on is ongoing income in the form of financial payments (residuals) when works they have created are re-broadcast in supplemental markets. They are in effect economic rights, which adhere to their work.

In other words, our industry's residual system – which in the DGA's case has existed for 50 years – is designed to provide appropriate compensation to those of us whose contributions to these works are so fundamental that without us they cannot be produced. That is why residual payments are part of our basic contractual agreements with the Motion Picture and Television Producers.

I hope this explanation underscores why I am here today. When movies and television shows are illegally copied and distributed, movie studios are being robbed of the revenue which will be used to keep production alive in our industry. This results in income – both directly and indirectly – taken from our pockets.

In the age of digital broadcast transmission and the analog hole gap, this income is at serious risk. I think I can help illustrate this in personal terms. I have been in this industry for 30 years. I am a director and I have also been an actor and a producer. One of productions I am very much identified with is *Star Trek: The Next Generation*. I have acted in both the television series and the movies, and I have directed numerous television episodes of different series. I don't believe it would be an exaggeration to say that *Star Trek* is a "rather" popular and financially successful "franchise" for both Viacom and CBS. It is valuable to them and it is valuable to me and other film industry workers who have been part of this production. And what brings the public to watch *Star Trek* is also what makes it a prime target for pirating.

And it has indeed been pirated. Sometimes the public knows it has a pirated work; other times they don't. For instance, the studio and network often get complaints from people about the inferior quality of a DVD they have purchased on auction websites. Well of course what they are purchasing, often without the knowledge of the website, is a pirated copy of *Star Trek*. And there are thousands of such auctions. CBS has sent out more than one thousand notices relating to thousands of auctions of bootleg copies of *Star Trek*. In 2004 Paramount Pictures Corporation had more then 20,000 unauthorized auctions of their copyrighted property—*Star Trek* among them. In 2005, *Star Trek Enterprise*, the latest television series, was registered with the MPAA for its auction site take-down efforts. That year they found over 13,000 auction sites of DVDs of movies and television shows which were offered online but not yet released in DVD—again, *Star Trek* among them. This represents significant financial losses for the network and all the individuals I work with who have been responsible for making *Star Trek*. Believe me, piracy is not an abstraction to filmmakers.

The ability to earn a living and take care of ones family, in both the present and the future, is a paramount issue for DGA members and their families, as it is for all Americans. We cannot afford to have our livelihoods weakened by individuals – or institutions – who think downloading and sharing our members' copyrighted work is their "right" without regard to the very real economic consequence of their actions.

We fully understand that the analog hole is a difficult problem that requires technologically complex solutions. But the digitization of content that can now be transmitted, converted to analog, and then converted back to digital "in the clear" provides a quantum leap in the potential for unauthorized redistribution of copyrighted work. That is why the threat to our economic livelihood is so much greater than anything that has come before. Ever growing numbers of individuals are uploading and sharing digital files with millions of users—with no remuneration to our members, the creators.

We create film and television productions that are enjoyed by millions of people around the world. That is possible because of the success of the economic structure on which these works are sold, a foundation that relies in large part on profits from resale rights both in the United States and abroad. Now that economic model is threatened.

The film industry and the viewing public have mutually benefited from technological developments that have enhanced viewing choices. But new technology also poses challenges that we must be prepared to deal with to protect copyright, not only for the benefit of film industry workers but also the viewing public.

In closing, I want to thank you Mr. Chairman, Senator Leahy and Senator Hatch for the leadership on the issue of piracy that all of you have shown over the years. We look forward to working with you on solutions to this very important problem. I will be happy to answer any questions you have for me.

TESTIMONY OF CHRIS COOKSON
PRESIDENT OF TECHNICAL OPERATIONS AND CHIEF TECHNOLOGY OFFICER
WARNER BROS. ENTERTAINMENT INC.

BEFORE THE

UNITED STATES SENATE
COMMITTEE ON THE JUDICIARY

THE ANALOG HOLE: CAN CONGRESS PROTECT COPYRIGHT AND PROMOTE INNOVATION?

June 21, 2006

Introduction

Chairman Specter and Ranking Member Leahy, thank you for inviting me to testify today. My name is Chris Cookson and I am the Chief Technology Officer of Warner Bros. In 2002, Mr. Richard Parsons, now Chairman of Time Warner, testified before this Committee and identified three challenges facing the audiovisual industry in its transition from the analog to the digital world that could not be addressed purely in the marketplace, but would require some sort of government intervention. Those three issues were the problem of protecting unencrypted digital broadcasts, the explosion of peer-to-peer piracy, and the analog hole.

The first issue was taken up by the FCC in its Broadcast Flag rulemaking procedure and is now being addressed in the legislative process.
The second issue, peer-to-peer piracy, was examined by the Supreme Court in the *Grokster* decision of 2005 wherein providers of peer-to-peer services that induced massive amounts of copyright infringement were held liable. As a result of the *Grokster* ruling, more and more audiovisual content is being made available legitimately over the Internet and new licenses between studios and Internet distributors are being announced almost weekly. For example, Warner Bros. recently announced an agreement with BitTorrent to sell downloads and video-on-demand streams of our films using BitTorrent's peer-to-peer technology.

The third issue remains unresolved and is the subject of today's hearing: the analog hole. Mr. Glickman and, four years ago, Mr. Parsons described the crux of the analog hole problem. It stems from the fact that we all have old analog TVs. When we receive digital audiovisual content, if we are to be able to see it, it has to be converted into an old-fashioned analog signal that our TV can understand. When this happens, the digital technologies that protect that content from unauthorized copying and redistribution are lost. In my testimony I will try to concentrate on the practical aspects of maintaining consumer choice and facilitating the digital transition.

Today—In the Middle of Digital Transition

We are transitioning from the Analog world in which we've been living, to a new all Digital world. That Analog world had order and structure to define and delineate our choices in making use of audiovisual content. For example, you could rent a tape and take it back, or if you kept it, you knew you would pay more. You could decide.

Unauthorized copies degraded badly and re-transmission wasn't readily possible.

A new fully Digital world will also allow distinction between consumer choices. Based on how the consumer wants to use content, and the terms under which that content is offered, technologies like encryption can be used to protect and authorize the experience selected. For example, you can choose to watch a movie once, have it to watch for a week, or keep a copy in a personal library, and so on. You, the consumer, can decide.

This Digital world also allows unsecured content to be copied and transmitted easily, quickly inexpensively and endlessly. Without loss of quality.

Today we're in the middle of the transition from the Analog world to the fully Digital world. More and more often, content is delivered digitally, but since most of us still have those analog TVs, digital content is de-scrambled and turned into analog so that we can see it. When that happens, all the distinctions between the offers we might have chosen are lost. The content can easily be re-digitized, resulting in a nearly perfect file that can be copied endlessly and re-transmitted anywhere.

The risk is that we'll become mired in this transition. With all digitally connected products, a consumer is given guidance to stay within the rights he or she acquired – so that the answer to "can I copy?" sometimes is "no." Manufacturers can increasingly avoid these content use choices and guidelines by bringing new products to the market that allow *any* use of content, whether agreed or not, simply and without asking – by digitizing that analog output. In this environment, consumers will be increasingly confused about "rights" and may come to regard

devices that digitize analog as the "more flexible" product rather than all digital products that abide by content consumption choice guidelines. If this happens, the digital transition will be impeded.

Consumer Choice

Consumers need and deserve a clear understanding of the terms of an offer they can accept and the bounds of the functionalities they will receive. We expect that most consumers will respect copyrights when:

- the content offer is perceived as fair and a good value,
- the content offer is easy to use,
- the quality of service meets the consumer's needs and expectations,
- the outlines of the agreed uses are understandable and clearly conveyed, and
- an attempted use that crosses the line is identified as such and is not readily fulfilled.

As content producers, our job is to figure out how to make appealing, fair, understandable, quality choices available to consumers. Our goal is to offer our content in as many legitimate ways as possible so that the consumer can choose when, where and how to enjoy it. Thus, we offer our films in theaters, on DVD, on pay-per-view and video-on-demand services, via Internet delivered electronic sale and rental, and on pay and ultimately advertiser-supported free television.

It is in our business interest to make our content available to consumers in ways that consumers will find attractive. And we are constantly looking for new and innovative ways to distribute our content to consumers. But to do that effectively, we must have the means of delineating and maintaining the distinctions among the various offers. For instance, if a consumer wants to pay a lower price to view one of our films once, rather than own a permanent copy, we need to have the means to ensure that the "view once" option isn't readily subject to copying.

Today's new digital products with analog inputs can completely blur the lines of understanding, making it confusing for consumers.

- Should it cost more to buy a copy of a movie for my library than to simply watch it once?
- If I can put a copy in my library by recording a pay-per-view movie from the analog output of my cable set-top-box, am I foolish to buy a copy?
- Am I doing anything wrong if I'm just using normal consumer electronic and computer equipment the way it was designed and sold?
- If paying the pay-per-view price gives me a copy, can I pay less if I REALLY only watch it?

Consumers lose if there is no way to distinguish between uses.

Until we address the threat of losses from digital piracy of works that have lost their protections via the analog hole, content owners will have difficulty making new consumer offerings and choices available.

Respect for Copyright

Technical protections for digital content can be defeated in two ways: (i) circumvention and (ii) the analog hole. When a person chooses to circumvent the technical protections on a digital work, he or she must make use of a circumvention device, such as the De-CSS[1]software that defeats the encryption protection of DVDs. This act of circumvention is conscious and willful. And the Digital Millennium Copyright Act ("DMCA") clearly defines both the act of circumvention and circumvention devices as illegal.

The analog hole is very different from circumvention, even though the result — unauthorized appropriation of the content and digital piracy—is the same. With the analog hole, no illegal circumvention devices or circumvention activity is involved. Rather, a person uses perfectly legitimate equipment hooked up in a perfectly legitimate manner that seamlessly permits unauthorized copying and redistribution of copyrighted content.

For example, if a person plugs the analog output of their DVD player into the analog input of a DVD recorder, that DVD recorder then can digitize the analog content and make multiple perfect digital copies onto recordable discs. The same holds true if the analog output of a DVD player is plugged into the analog input of a video capture card or USB dongle for a personal computer. Although the copyrighted content of the DVD disc was scrambled and protected, this protection is lost when the content is converted into analog in the clear. The analog output of a DVD player does not, and cannot, "know" whether it has been plugged into your analog television set for legitimate playing and viewing or is being plugged into a recorder or PC for unauthorized re-digitization, copying and retransmission.

What is particularly insidious then about the analog hole is that it facilitates unauthorized copying and redistribution without the involvement of any illegal circumvention devices or any overt act of circumvention. Or more importantly, without the consumer clearly knowing or understanding that he or she has done anything wrong. While the unauthorized copying, distribution and/or retransmission of copyrighted content violates copyright laws, consumers are not given any concrete guidance or boundaries to avoid this activity because the analog hole so readily facilitates the copying and redistribution through the use of legitimate equipment available in any consumer electronics store or shopping mall.

[1] CSS, or Content Scramble System, is the copy protection technology found on DVDs.

Facilitating the Digital Transition

Beginning about ten years ago, the consumer electronics, computer and motion picture industries began meeting in a forum open to the public and all interested attendees to determine how technology can be used to bring digital content offerings to the market and protect such content from unauthorized copying and redistribution. This Content Protection Technical Working Group (CPTWG) has held nearly 100 sessions of this forum to explore how technology can be used as the basis for voluntary agreements to distinguish among various offers and uses of content and to protect digital content from unauthorized use. Several voluntary agreements have resulted from the work of the forum. They include agreements to deliver digital content to the home on DVD discs using the Content Scramble System (CSS), to deliver digital content across home networks using Digital Transport Content Protection (DTCP) and to deliver high data-rate content directly to digital displays using High-bandwidth Data Content Protection (HDCP).

These various agreements are "voluntary" in the sense that a system's maker or user can choose to either ignore the content, or choose to make use of it. If consumers should chose to ignore it, the system cannot access the content since it is obscured, encrypted, and of no use. If they choose to use the content, they can accept the offered terms of use and the keys to unlock the content are provided. Their products will then, under contract, be required to abide by the terms of use for the content set forth in the license. An attempt to use the content by circumventing the protecting technology will not be allowed under the DMCA.

The touchstone for these various voluntary agreements is that the content must originate in scrambled or obscured form such that access to the content depends upon on entering into the voluntary license agreement and accepting the offered terms of use in order to obtain the keys to descramble the content. Products that send and receive digital content in this manner must have the capacity to control and authorize access to the content through authentication and decryption processes.

The problem with analog connections is that they lack the capacity of such authentication and decryption. The standards for these connections are over 50 years old. Existing analog television sets simply aren't able to decrypt or descramble content. Therefore, in order for content to be viewable on such televisions, it must be in the clear. Once protected digital content is converted into analog in the clear, there is no longer a basis on which to build a voluntary agreement that would attach conditions to the access and use of that content. No license and no decryption keys are required. Rather, any device with an analog input can get ready and unrestricted access to any analog content in the

clear. And there is no contractual basis on which to attach usage rules or guidelines.

Therefore, the voluntary license and market-driven approach upon which the roll-out of digital content protection technologies is based simply doesn't work when it comes to analog signals and particularly to the problem of re-digitization of such analog signals. All three industry groups that participate in the forum recognized this inability to find a voluntary structure that would address this problem and all acknowledged the need for some sort of regulatory approach. As a result, it convened a special study group called the Analog Reconversion Discussion Group (ARDG) to examine different ways for protecting content across analog connections and addressing the problem of the ready digitization of analog signals in the clear.

During the course of the work of the ARDG, it was shown that even without a contractual obligation to do so, some manufacturers of digital devices with analog inputs do look for content usage information in analog signals and re-apply protections when the signals are digitized. No contract compels this, only a respect for the copyrights in that material. However, many other manufacturers of similar analog input digital devices choose to ignore such content usage information and sometimes even promote the ability to do things like copying DVDs. Products such as simple USB plug-in analog to digital converters and video capture cards for computers simply do not need a license or permission to capture and digitize analog video signals. The question thus arises: how long can manufacturers who choose to respect copyrighted material afford to give up market share to those competing product manufacturers who choose to exploit the ability to have their products offer uncontrolled and unrestricted copying and redistribution?

It became clear that a narrowly targeted regulatory approach is needed to level the playing field among all manufacturers so that all digital products with video analog inputs treat re-digitized copyrighted commercial content as if it had remained in digital protected form all along.

The urgency for addressing this problem is growing as devices that take advantage of the analog hole are becoming increasingly common on store shelves and the Internet. In fact, on the Internet, you could buy a "capture card" for your PC that uses the analog hole to duplicate copyrighted material for about $25 - with a $25 rebate - essentially for free. The more common these devices become, the less consumers will be able to distinguish what they should or should not be able to do with content they purchase. A normal consumer would naturally assume that if they can buy such a device on a store shelf from a legitimate merchant, it must be legal, right?

But how do we level the playing field so that all manufacturers treat re-digitized analog content as if it had remained digital?

Solving the Analog Hole Problem

We believe there is a good technological compromise that would allow re-digitized content to be protected as if it had stayed digital. This solution involves the integrated use of two signaling technologies:

- One is a code attached to the picture (CGMS-A) in the same manner as Closed Captioning or V-Chip information, that indicates the permitted uses of the content - for instance that no copies are allowed, or that it can be copied once, or that it has no limits on the copies that can be made.
- The second is a mark embedded in the picture itself (Rights Assertion Mark) that indicates only that a copyright is asserted and that CGMS-A should be present.

Both of these technologies are necessary to fix the analog hole. CGMS-A is not in the active picture and if it's lost, it leaves no record. It is easy to "lose" in some steps of video processing. Additionally, some analog technologies, like VGA which is intended strictly to drive displays, do not allow for CGMS-A in the signal.

The technology proposed for the Rights Assertion Mark, Veil, has been used for many years in toys and games and for tracking of television advertising. It is similar to, but much less complicated to implement than, a traditional watermark. It is much more difficult to strip out than CGMS-A and won't be accidentally "lost." It has been tested extensively and when it's embedded in a picture is invisible to the human eye at normal insertion levels.

The net effect of using both of these technologies is that consumers will get the "bright line" that they deserve. Let me be clear – these technologies are not intended to resist determined commercial pirates who want to hack through them. They are designed to provide normal consumers with a way to determine when they are crossing the line and using content in a way that was not intended. We believe that most consumers, if they know where this line is, will not cross it.

Misapprehensions

Misapprehensions about this solution have been built on misunderstandings and faulty information. It's been claimed that this approach is too broad and it will impact everything from cars and toasters to F-16s. That it will prevent timeshifting of favorite programs from HBO. Or it will banish Tivo and squash innovation. We've also heard that it is too weak and not worth doing since it could be hacked by determined hackers.

None of these are true.

The compromise solution that has evolved is focused only on those devices that recognize analog video specifically. The only need is to assure that those devices that normal consumers buy specifically to capture analog video will recognize controlled content and protect that content when sending it onward. Nothing for toasters or F-16s.

Most content will be marked for one generation of copying and allows for normal timeshifting. Only special cases such as Pay-Per-View video or packaged media like DVDs can be marked to prohibit copying.

Most Personal Video recorders like Tivo already get their content directly in digital form either from a cable or satellite operator. I love my Tivos, but what they can do is already subject to the kind of controls we are suggesting. Rather than squashing innovation, this approach only asks that innovators finish the job of considering the unintended consequences of what they create.

Finally, if the goal is to give normal consumers clear lines and information, this will be a success so long as the information isn't "accidentally" lost. Even if hackers overcome these marks, this effort will be worthwhile whenever normal consumers recognize and respect the terms of the offers they accept. If that happens, the transition from analog to digital will proceed on merit.

We need legislation in order to implement these technologies and fix the analog hole. Unfortunately, this is a problem that cannot be solved by the marketplace.

Some have suggested that a simpler solution to this problem would be legislation that imposed a mandatory sunset on analog outputs. Such a solution would prevent content from even being exposed in analog form and have the advantage of imposing no implementation cost on analog to digital converters. However, the disadvantages of this approach are numerous.

First, under this approach, television sets with only analog inputs would be unable to function with new entertainment products and devices because such new devices would lack the necessary analog connections. This would harm those consumers who can least afford to buy new digital television sets. Second, under a sunset approach, consumers would be forced to replace home entertainment equipment, such as a VHS recorder, before the end of its useful life with new equipment since it wouldn't work with newer devices that were subject to the sunset and had no analog outputs. Third, a sunset would not impose any restrictions on analog to digital converters. Thus, as long as any legacy products with analog outputs remained in consumers' homes, the analog hole problem would persist. Additionally, to be effective, literally thousands of devices would have to come under regulation. Finally, any sunset of analog

outputs is likely to be so far out in the future that it would have little remedial benefit.

In contrast, the approach of regulating only video analog to digital converters by a narrowly targeted law would ensure that existing equipment, both analog and digital, in consumers' homes would continue to function with full capability until the end of its normal service life. The breadth of products regulated under this approach would be far less than the range of products that would be affected by an analog sunset. And the approach of requiring video analog to digital converters to detect and respond to CGMS-A and the Veil Rights Assertion Mark would ensure that digital content would be treated consistently whether it got converted into analog or remained digital. In this way, consumer expectations would be clearly defined.

House Judiciary Committee Chairman Sensenbrenner and Ranking Member Conyers have introduced legislation, H.R. 4569, that will mandate the use of the CGMS-A and Veil technologies in devices that re-digitize content.

We have received support for this bill and for our technological solution from some in the high tech and consumer electronics industry. I would like to submit for the record the attached letters from IBM and Thomson. However there are others who call this bill a "tech mandate" and say that it's too burdensome to implement.

We agree that mandates on technology should be a last resort and used only when a marketplace solution cannot be found. In this situation, most in the tech industry agree that there is no marketplace solution and none has been suggested. In addition, this proposal merely selects an uniform method of signaling.. This is necessary if we are to avoid confusion from looking for messages in multiple and potentially confusing and conflicting codes. A manufacturer shouldn't have to look for a Warner Bros. code and again separately for one for Disney or Fox. The actual technologies used to protect the content can be many and varied – as many and as varied as those in the market that are and can be used to protect that same content when it is distributed in fully digital form in the first place.

Some have argued that implementing CGMS-A and Veil as a fix to the analog hole will be too costly and burdensome for the tech and CE industries to implement. They say that it could cost hundreds of millions of dollars to add in the CGMS-A and Veil technologies to their devices. Our estimates, however, place the cost at around one cent per device to implement. In addition, the fix would be implemented in devices going forward and phased in over time. And, we should remember that much of the value to consumers of these devices derives from the content, our content, that they will still be able to record.

What if the Analog Hole is Not Fixed?

In short, consumers lose. If we can't distinguish between consumer uses when analog is permitted, the most valuable content will migrate to only digital formats because they will be most protected from unauthorized use. This means that only those who invest in new systems will be able to access this content. Consumers with TVs that have only analog inputs may have to wait longer for the opportunity to see new releases. Already, new products and services are entering the market that either can or do limit real High Definition images to only those sets equipped with digitally protected inputs.

Consumer choices will be limited for those who have TVs that still depend on analog. A real "View Only" offer could only be made to consumers without the analog exposure – other offers would have to consider and factor in the possibility that a copy was being made by even average consumers.

The production and market life of analog devices will be artificially extended and the digital transition will slow.

But, if we can get this problem fixed, consumers will get many more choices – they can expect to see exciting new offerings like HD movies on pay-per-view, and so on…

Consumers would have the normal use of their analog devices for as long as the products last.

One size doesn't fit all – Consumers can expect a broader range of choices tailored to their desires. If we solve the analog hole problem and consumers do choose to re-digitize an analog video signal, they get essentially the same choice and uses of that content as if the content had stayed digital. They will have a clearer understanding of the value of the choices they make. And the value of copyright will be protected.

Digital Technologies will Win on Merit.

We believe that, on merit, digital wins. Consumers will get:

- More choices
- Better performance
- Better reliability
- At lower cost…

We believe that, with a level playing field, digital technology is a better consumer proposition. We ask your help in leveling the field

Testimony of the Honorable Dan Glickman
Chairman and CEO of the Motion Picture Association of America
Before the Senate Judiciary Committee Hearing
"The Analog Hole: Can Congress Protect Copyright and Promote Innovation?"
June 21, 2006

Chairman Specter, Ranking Member Leahy, members of the Committee:

On behalf of the member companies of the Motion Picture Association of America, I thank you for the opportunity to talk to you about the analog hole and how the Congress can protect copyright and promote innovation by removing the current disconnect between our analog past and our digital future.

Intellectual property has consistently proven to be this country's greatest export. In the marketplace of imagination, America's innovators and creators are unsurpassed. However, the viability of this creative output is reliant upon our ability to protect it from being devalued by theft. In a time where America is working to remain competitive in the global marketplace, this nation will prosper or it will fail in large part based upon how we protect our nation's greatest assets...the skill, ingenuity and creativity of our people.

The American film industry, like all of the creative industries, combines capital and talent to produce intellectual property. It is not easy to create a movie. It requires lots of money, lots of skilled workers, and lots of hard work. In fact, four out of ten movies don't make back their investment. So the movie industry is fraught with risk. Despite these hurdles, the American film industry is the most successful in the world. Our industry has a positive balance of trade with almost every country in the world and is one of our best job creators.

The member companies of the MPAA are excited about the future of our industry and are working hard to make a successful transition to the digital world. This digital future will ultimately allow viewers to watch virtually any movie, at any time, at any place, at prices dictated by a competitive and thriving marketplace. While there are many hurdles to overcome in making this vision a reality, our member companies are responding to the consumers who are their constituency and are committed to meeting this need.

Studios and networks are expanding their distribution channels to harness new technologies to deliver content in a variety of new ways. New ventures and offers are being announced in rapid fire succession. These are a sampling:

- Warner Brothers partners with Free Record Shop using P2P distribution
- Universal partners with LoveFilm in UK, offering downloads
- CBS and Verizon FiOS TV partner to carry select programs
- Disney offers feature length film on iTunes
- CBS delivers college basketball "March Madness" online
- ABC offers free streaming of shows at ABC.com
- Disney re-launches MovieBeam as a new digital VOD distribution channel
- NBC Universal launches Aeon Digital set top box
- MTV Networks partners with Microsoft to offer digital music and video downloads via URGE.
- MTV Networks offers thousands of free on-demand videos via its broadband channels, including MTV Overdrive, Nick Turbo, V-Spot and Motherload
- CBS offers select programs on demand
- Warner Bros. launches P2P service In2Movies in Germany
- Fox announces VOD and DVD windows collapsed
- NBC Universal announces Peer Impact deal
- Disney announces download-to-own deal for full-length feature films with CinemaNow
- Google Video beta launched – essentially is going with a wholesale reseller model – creating an iTunes-like store.

However, while the industry embraces the many opportunities of the future, it also must confront the ever present threat of theft.

The pilfering of our films costs our industry approximately $6.1 billion dollars a year. On the Internet front, it has been estimated that as much as two-thirds of Internet bandwidth in this country is consumed by peer-to-peer traffic, with much of that volume attributable to movie theft.

And it is only getting worse. Pirating DVD's is more lucrative than selling heroin for many criminal gangs. A recent study showed that 62 percent of our industry's piracy is attributable to illegally produced DVDs. New technologies enable criminals to acquire movies, burn them onto DVD discs,

and then sell them on the streets or through a global storefront on the Internet with amazing speed.

The MPAA works very effectively with the U.S. Department of Justice, the FBI, Customs and local law enforcement to crack down on these gangs. We also are providing more and more legal alternatives for on-line movies. We are working to help our schools teach kids that stealing on the Internet is as wrong as stealing from a store. We are investing in the future to find cutting-edge technologies that will get movies to consumers while protecting copyrights. And we are working with our colleagues in the consumer electronics, computer and online service provider industries on the development and implementation of digital rights management ("DRM") technologies to offer consumers a wider array of choices for enjoying the content we produce.

But commercial piracy is not the only challenge we face in the new digital environment. We also must develop secure delivery systems so we can offer consumers the viewing options they desire while maintaining a sound fiscal base to sustain our industry. We are embracing DRM technologies so that we can offer consumers more choices at a greater variety of price points: one consumer may want to purchase a permanent copy of a movie while another may want to watch it only once—and at a lower price. To sustain the viability of this array of different offers, however, we must be able to maintain the distinction among them. Thus, we need to provide technical safeguards to ensure that the consumer who opts to take advantage of a time-limited viewing option at one price is not, in fact, getting the benefit of the sale option. Otherwise the price of the time-limited model will naturally migrate toward the sale model, all to the detriment of the honest consumer. In using the phrase "technical safeguards" I do not mean to imply that we seek absolute protection against unauthorized use of our movies. We understand that committed pirates will break any security measures we can devise and these pirates will have to be dealt with by way of criminal and civil legal remedies.

However, we can, and must, implement basic technological measures to delineate for consumers the differences among our various content offerings and to discourage what I call "casual misuse" of our intellectual property. At the end of the day, the economic impact of a thousand otherwise law abiding citizens making an extra copy of a movie they purchased and

"sharing" it with a friend has the same impact as a single commercial pirate selling a thousand copies of a movie on a street corner.

In many cases, the DVD being a prime example, we have worked with the technology companies to develop and implement secure delivery systems supported by technical measures and voluntary contractual relationships. However, there are some areas where private sector solutions alone will not work. The analog hole is an example of an area where such assistance is needed.

What is the analog hole?

Let me try to explain it as simply as I can.

While film content is increasingly arriving into American homes in protected digital form, such content must be converted into an analog format to be viewed on the overwhelming majority of television sets in U.S. households, which can only process and display an analog signal. When digital content protected by digital rights management technology is converted to analog form for viewing on legacy analog television equipment, the content is stripped of all its digital protections. This analog content can then be redigitized "in the clear," without any protections whatsoever. This redigitized and completely unprotected content can then be efficiently compressed, copied and redistributed without degradation. It can also readily be uploaded to the Internet for unauthorized copying and redistribution. Like a black hole, the analog hole sucks in all content protections, leading to two problems.

First, it eliminates the "lines" or boundaries among the different viewing opportunities we are trying to bring to consumers and makes it difficult to sustain the choices for consumers that digital rights management technologies otherwise help facilitate.

Second, it creates a significant loophole for our industry in the fight against piracy.

This is not an idle concern. While some manufacturers voluntarily design analog to digital conversion devices to respond to analog copy protection information such as CGMS-A, others market devices specifically designed to exploit the analog hole. We have a situation where bad actors are reaping

a windfall at the expense of motion picture companies and ultimately consumers, and good actors are placed at a competitive disadvantage.

Movie studios are actively engaged in developing and offering innovative new business models to give consumers greater flexibility and more choices for how and where they access and enjoy movies and television shows. All of these models depend, however, upon a secure environment which protects this high-value content from rampant theft and redistribution. Devices that permit exploitation of the analog hole, whether by design or otherwise, undercut this framework and consequently limit the viewing choices that can be made available to consumers.

Because of the ease with which it can be exploited, the analog hole creates a gaping hole in digital rights management protections, allowing high value content to be copied and re-transmitted without limit. Of particular significance is the fact that exploitation of the analog hole requires no act of circumvention, nor any unauthorized circumvention devices prohibited by the Digital Millennium Copyright Act (DMCA). Instead, the analog hole can be exploited solely through the use of general purpose home equipment. In some cases such equipment is specifically designed to permit people to take advantage of the analog hole to defeat digital rights management measures. In other cases, analog inputs and outputs serve a legitimate purpose and the analog hole is a byproduct. Closing the analog hole would place these analog to digital conversion devices on an equal footing with all-digital devices by maintaining the integrity of digital rights management measures.

Narrowly focused and targeted legislation is required to implement an analog hole solution. Such a solution will create a level playing field for device manufacturers and allow content providers to tailor their offerings to consumer desires. Legislation will help ensure that good actors are not disadvantaged by companies who do not play by the rules and enable content owners to provide consumer choices without running an unacceptable risk of promoting theft.

The MPAA and its member companies have worked closely with representatives from the computer and consumer electronics industries to reach consensus on a technological solution for the analog hole. These talks have been productive and have shown positive movement. Virtually every major consumer electronics and information technology company as well as

a number of self styled "consumer" groups, including the Electronic Frontier Foundation, participated in an Analog Conversion Working Group where a broad consensus was reached on the need to address the analog hole problem and on the attributes a solution should have.

The technological solution provided in bipartisan legislation introduced in the House by Judiciary Committee Chairman Sensenbrenner and Ranking Minority Member Conyers reflects these multi-industry talks and is consistent with the consensus that came out of that process. It provides for a robust analog rights signaling mechanism that does not interfere with consumers' ability to fully enjoy the content they receive. Known as "CGMS-A plus Veil," Analog Copy Generation Management System (CGMS-A) coupled with the Veil Technologies Rights Assertion Mark provides a practical degree of protection from unauthorized reproduction and redistribution while not diminishing a consumer's viewing experience. **Indeed, the honest consumer who does not attempt to violate her agreement with the movie distributor by making copies or redistributing the movie will have no reason to know that the analog hole has been closed.**

I want to emphasize that the Analog Hole has been the subject of intense scrutiny by technology and content communities, as well as other interested parties, in open forums consuming literally thousands of man-hours of discussion. It is a documented fact that there is broad consensus that these are issues that need to be addressed. There is also broad consensus on the nature of the solutions that should be considered.

Chairman Specter, Ranking Member Leahy, members of the Committee, I appreciate this opportunity to discuss these matters of concern to our industry and I look forward to answering any questions you may have regarding what I have just discussed.

Statement of Senator Patrick Leahy
Ranking Member, Judiciary Committee
Hearing on "The Analog Hole: Can Congress Protect Copyright and Promote Innovation?"
June 21, 2006

I thank Chairman Specter for holding this hearing today. We have devoted considerable attention in recent years to the important issue of protecting creative works in the digital age without stifling the innovative technologies that deliver those works to consumers. Today, we turn to another aspect of this problem – the so-called "analog hole."

Content owners are concerned over a gap in copy protection of their digital works. This gap, the "analog hole," opens up when digital input is converted into an unprotected analog form so it can be viewed clearly on the millions of analog TV sets in households across the country. That analog content can then be re-converted into unprotected digital form and put on the Internet; once digital content falls into that hole, it loses its digital protection.

The possibility that this digital-to-analog-back-to-digital transformation could facilitate the mass indiscriminate redistribution of copyrighted video content is certainly real. As we have learned from past experiences – such as the unfettered illegal sharing of content over peer-to-peer networks that cost the copyright industries millions of dollars – there are many reasons to work hard to end the infringement of copyrighted goods. The theft of copyrighted works harms consumer, threatens business, and enriches illegal enterprises.

Congress has an obligation to help ensure that copyrights are respected and copyrighted materials are protected; nonetheless, we should be cautious about government-sanctioned technology mandates, which, at best, may be a temporary solution to a complex problem.

Technology invariably moves faster than legislation, and for that reason, industry participants are often better equipped to determine what will work and what consumers will buy. The inexpert hand of government is not as effective as the relevant markets in moving assets, and interests, to their best uses.

I am committed to finding the best solution to this problem, and am hopeful that our discussion today is the next important step to moving us forward to the answer. I look forward to hearing from our witnesses and thank them in advance for their participation.

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WRITTEN TESTIMONY OF SCOTT P. MILLER, EXECUTIVE VICE PRESIDENT, VEIL INTERACTIVE TECHNOLOGIES

BEFORE THE

UNITED STATES SENATE COMMITTEE ON THE JUDICIARY

THE ANALOG HOLE: CAN CONGRESS PROTECT COPYRIGHT AND PROMOTE INNOVATION?

June 21, 2006

Chairman Specter, Ranking Member Leahy and members of the Committee:

Thank you for holding this hearing on "The Analog Hole: Can Congress Protect Copyright and Promote Innovation." I appreciate the opportunity to share some history of our company and address some questions regarding our technology.

Video Encoded Invisible Light ("VEIL") is a widely used, patented technology platform. At its core, VEIL relies on variations to the luminance of television and video signals that are imperceptible to the human eye. Through VEIL, data can be sent through the active portion of video without impacting the integrity of the picture to the viewer.

Koplar Interactive Systems International, dba VEIL Interactive Technologies ("VIT") is a privately held company with headquarters in St. Louis, Missouri and administers and licenses the VEIL technology. Koplar has been in the broadcast business for over forty years, owning and operating television stations in both St. Louis and Sacramento. Another Koplar subsidiary, World Events Productions, has produced and distributed animated programming worldwide since 1984.

Since the late 1980's, VEIL data has been embedded into both pre-recorded and live programming for various purposes. This encoded content and been distributed internationally. An early use of the VEIL technology allowed television signals to interact with stand-alone devices. The first generation of applications involved toys that would interact with related television programs. This application of the VEIL platform

has been licensed and integrated into products by companies such as Merv Griffin Productions, Mattel and Tiger Electronics (now part of Hasbro).

Through partnerships with various product manufacturers, VEIL continues to enhance toy and game play interaction with television and video. The consumer product segment of the business has licensed the technology and know how for promotional programs as well. VEIL was used by AT&T Wireless and Ericsson Mobile Phones to enhance a promotion that launched their first internet capable cell phone. And in 2006, VEIL was the technology used for an innovative promotional campaign tied to the Australian cricket season. The major sponsor, Foster's Beer, reported their best first quarter in over a decade as a result of the campaign.

VIT's consumer business is focused on working with content providers and the CE industry to create a new experience in watching television for the viewer. It is our hope to help preserve the integrity of television production, while providing a new standard of measuring consumer interest for advertisers and broadcasters.

VEIL has been employed for tracking and verification services in the field of television advertising since 1992. VIT's Commercial Business segment has a long standing license partnership with TNS and their Media Intelligence (formerly CMR) business. The Media Intelligence technical infrastructure utilizes VEIL technology to provide broadcast verification and ad tracking in the top 100+ markets in North America. The system is relied upon every day by national advertisers to track their programming.

In 2004, VIT licensed the technology to affiliate company VCP for use as a content protection technology. VCP designed a system using the VEIL technology to create the VRAM (VEIL Rights Assertion Mark) as a point solution addressing the "analog hole."

The VRAM system consists of an encoder and a detector. The encoder inserts the VRAM signal into the viewable portion of the video. The detector searches for the VRAM signal until it is found with certainty. The VRAM signal is a non-data-carrying signal whose presence asserts that rights should be associated with the content in the vertical blanking interval ("VBI") via the CGMS-A bits. The VRAM detector can only assume one of two states: searching for a VRAM signal or a VRAM signal detected with certainty (i.e., the VRAM is either absent or present). It is fairly trivial to strip CGMS-A either inadvertently or maliciously as it resides in the VBI. The VRAM is much more robust to inadvertent stripping or malicious attacks.

The VRAM was designed recognizing four critical parameters: Vulnerability to impairments, imperceptibility, probability of false detection and ease of implementation. Independent third party testing conducted by National TeleConsultants of Glendale, California in the spring of 2005 concluded that the VRAM satisfies or exceeds the metrics set forth by the Consumer Electronics, IT, and Content Industries with respect to the issues and characteristics tested by National TeleConsultants. An executive summary of the test results is attached.

The testing showed that in the area of robustness, the VRAM was still detectable even with the introduction of 10 different impairments that were designed specifically to strip the VRAM. In the visibility portion of the testing, a total of 3,045 clip comparisons were performed by 46 viewers, including studio "golden-eyes," representing eight different organizations. Roughly two-thirds of the viewers could not discern any noticeable difference between marked and unmarked clips. Of the remaining third who thought they saw something, the results concluded that the participants could have flipped a coin and achieved the same results. That is to say, they were right fifty percent of the time and wrong fifty percent of the time.

The metric for probability of false detection set forth by the CE industry is 10^{-12} (one in one trillion). The statistical analysis of the VRAM was conducted by Dr. David O. Siegmund, Chairman of the Department of Statistics at Stanford University and Dr. Guenther Walther, Associate Professor of Statistics at Stanford. They concluded the probability of a false detection of the VRAM to be between 10^{-13} and 10^{-42} depending on which analysis model is used. This clearly surpasses the metric of 10^{-12} requested by the CE industry.

A leading silicon chip manufacturer that specializes in analog to digital converters and an outside consulting firm have analyzed the VRAM with respect to implementation burden. Sample implementations and reference designs have been created by these companies. They concluded that implementation of the VRAM algorithm in silicon will use approximately 15,000 to 24,000 additional gates. Industry estimates show that this equates to USD$.01 to USD$.015 in additional cost. Additionally, these conclusions have been provided to a number of leading CE and IT companies for their own analysis.

We welcome the opportunity to engage with any other interested CE and IT companies who wish to learn more about the technical details of the VRAM. Like many interested parties in this issue, we are a company that takes all intellectual property, including our own, very seriously. Therefore, we request that any company wishing to obtain our detection algorithm and reference design do so under a straightforward, reciprocal non-disclosure agreement.

We have searched known intellectual property in the field and either own, control or have secured license to the discovered relevant patents, allowing us to provide the VRAM to Adopters and Content Providers. We recognize the unique status that legislation would give to VCP and commit to Congress that we will continue to provide VRAM on reasonable and non-discriminatory terms for the useful life of the application. For instance, equipment manufacturers that will detect VRAM as part of the analog hole solution are being offered a license to the technology on a royalty free basis, with payment of a single one-time administrative fee of $10,000 for unlimited use.

The VRAM technology, in conjunction with CGMS-A copy control information, gives content owners the ability to mark their content with usage rights in a robust manner that is, at the same time, simple to detect and inexpensive to implement.

Chairman Specter, Ranking Member Leahy and members of the Committee, thank you for giving me the opportunity to provide some insight into the VRAM technical solution for the analog hole problem. I look forward to working with you to answer any additional questions that you have.

Veil V-RAM Technology

Evaluation of Veil Rights Assertion Mark Technology

Report of Findings
Executive Summary

NationalTeleconsultants®

Project N3683-A

March 23, 2005

Executive Summary

National TeleConsultants has performed an evaluation of technology provided by Veil Interactive Technologies to embed a Rights Assertion Mark (RAM) within a video signal to identify the video program as containing copyrighted material. The RAM would indicate to a downstream recording device that it should inspect the Copy Generation Management System (CGMS-A) data in the vertical blanking interval of the video signal to determine the copying activities authorized by the copyright holder. Presence of a RAM without corresponding CGMS-A data would imply tampering with the video signal had occurred and recording could then be disabled.

The technology evaluation examined three aspects of the Veil RAM (V-RAM) system:

- Vulnerability of the V-RAM signal to video impairments

  Video containing the V-RAM signal was subjected to various impairments that may be encountered in normal program distribution as well as impairments designed to circumvent V-RAM detection. V-RAM detection rates for the impaired video were compared with V-RAM detection rates for unimpaired video.

- Probability of false detection of a V-RAM signal

  An analysis of the probability of falsely detecting a V-RAM signal in unencoded video was undertaken to ensure that the system would provide an acceptably low probability of false detection. The CE industry has requested a false detection rate of a one in one trillion [false detection probability of 1×10^{-12}] and the content industry has countered with a false detection rate of one in one hundred million [false detection probability of 1×10^{-8}]. This analysis was performed on samples of unencoded broadcast video received off-air from five different networks over a five-week period.

- Visibility of the V-RAM signal

  Visibility tests were performed using three different large-screen progressive-scan display technologies. Forty-six viewers from eight organizations participated in the tests.

Summary Results

- **V-RAM Signal Detection**

The following table contains the results of the detection tests. Higher V-RAM detection numbers indicate greater immunity to the video impairment indicated. Some video impairments resulted in unwatchable images. Only results yielding generally acceptable pictures are reported in this summary table.

Video Impairment	V-RAM Detections
None (Baseline)	26 (100%)
Impairment A	25 (96%)
Impairment B	24 (92%)
Impairment C	22 (85%)
Impairment D	21 (81%)
Impairment E	18 (69%)
Impairment F	17 (65%)
Impairment G	18 (69%)
Impairment H	26 (100%)
Impairment I	11 (42%)
Impairment J	25 (96%)

- **False Detection Probability**

A statistical analysis of over 880 hours of unencoded off-air video was performed to estimate the probability of a V-RAM detection occurring when a V-RAM detector is presented with unencoded video. The analysis was performed by Dr. David O. Siegmund and Dr. Guenther Walther of the Department of Statistics at Stanford University. Dr. Siegmund is Chairman of the Department of Statistics and Dr. Walther is an Associate Professor of Statistics.

The statistical analysis was performed using several techniques to model the data and estimate the false detection rate. The results of these analyses are summarized in the following table:

False Detection Rate Estimates

Analysis Model	False Detection Rate	Average Unique Content Duration Before False Detection
Independence Model	$< 3.4 \times 10^{-42}$ per Frame	$> 3 \times 10^{32}$ Years
Markov Chain (Empirical Transition Probabilities)	$< 1.2 \times 10^{-24}$ per Frame	$> 9.5 \times 10^{14}$ Years
Markov Chain (Estimated Transition Probabilities)	$< 1.2 \times 10^{-13}$ per Frame	> 9,500 Years

All of these results exceed the false detection rate of one in 100 million [1 in 10^8] proposed by the content providers and the false detection rate of one in one trillion [1 in 10^{12}] requested by the Consumer Electronics industry.

- **V-RAM Signal Visibility**

During each visibility test a viewer was shown 35 ten-second clips. Each clip was presented twice; once with V-RAM encoding and once without V-RAM encoding. The order of presentation of the encoded and unencoded versions of each clip was randomly selected and was not known to the viewer. The viewers were asked to identify the version of the clip containing the V-RAM signal and to rate its level of visibility. Most viewers participated in two visibility tests: one in which the video source was a broadcast video server and one in which the video source was a DVD player.

During the visibility tests a total of 3,045 clip comparisons were performed by 46 viewers representing eight organizations. In 2,175 (71%) of the comparisons the viewers indicated that there was no perceptible difference between clip versions, i.e. no visibility of the V-RAM signal. In 870 (29%) of the comparisons the viewers indicated a perceptible difference between clip versions presumably caused by the presence of the V-RAM signal in one version of the clip. Viewers correctly identified the clip containing the V-RAM signal in 434 of the 870 comparisons or 49.9% of the time. This is very close to the 50% result that would by expected from random selection of the clips.

The visibility test results were further analyzed by video source (uncompressed server or DVD) and by display type (HD-ILA, LCD, or DLP). In these test subsets the percentage of comparisons in which the viewer perceived a difference between clip versions and correctly identified the clip containing the V-RAM signal was in the range of 49.3% to 52.8%.

Before the
Senate Committee on the Judiciary

"The Analog Hole: Can Congress Protect Copyright and Promote Innovation?"
June 21, 2006

Statement of Gary J. Shapiro
for
The Consumer Electronics Association and
The Home Recording Rights Coalition

On behalf of the Home Recording Rights Coalition and the Consumer Electronics Association, I greatly appreciate the Committee's invitation to appear today. At CEA, we have more than 2,000 corporate members who contribute more than $120 billion to our economy and serve almost every household in the country. Any proposal that would impose a design mandate on new consumer technologies and devices needs to be considered carefully and at length, because the consequences may be far-reaching, unanticipated, and damaging.

The Home Recording Rights Coalition was founded almost 25 years ago, in response to a court decision that said copyright proprietors could stop the distribution of one such new and useful product – the VCR. Even the motion picture industry has admitted that it is glad that the Supreme Court allowed the VCR to be sold to consumers. But after saying they will never do so again, the entertainment industry keeps coming back to the Congress with proposals to subject new, legitimate consumer products to prior restraints on their usefulness in the hands of consumers.

We live in an analog world but do virtually all our processing in the digital domain. Semiconductor components and software products that alone, or in combination, convert analog video inputs to digital signals are, and will be, everywhere. We have

considered the subject of "analog hole" legislation for a decade, but over time it gets more, rather than less, complex and daunting. There are *lacunas* left in any draft legislation we have seen on the subject that reflect its complexity, the uncertainties caused by technological change, the lack of consensus, or all of these problems. Their continued presence is reason enough for extreme caution. But we have additional concerns.

We worked closely with the music industry and this Committee to help draft and enact the Audio Home Recording Act of 1992 – only to find out, years later, that the music industry no longer agrees with us that a consumer's right to make a first generation copy includes the right to play it back. Nor do they any longer agree that the words "No action may be brought under this title alleging infringement of copyright ..." have the meaning we all thought they did in 1992. (They do seem still to appreciate the word "royalties.")

We worked with this Committee and the motion picture industry on the Digital Millennium Copyright Act of 1998 (the "DMCA") and have also been surprised at some of the later interpretations of this law that have been urged on the courts. We are very cautious, therefore, in discussing, today, potentially the most sweeping technological mandate ever put into the copyright law.

Hard experience counsels that you establish some touchstones before even considering any such legislation. First, given the government's poor record in anticipating technological developments, the proponents must prove unequivocally that the drastic step of a technology mandate is necessary.

The motion picture industry has not met this burden. At this time, there is little evidence that the "analog hole" is contributing to the mass redistribution of content over the Internet, and even less that it is contributing to such redistribution of HDTV content.

Indeed, evidence points away from the analog hole as a source of pirated material. MPAA's own website claims that 90% of pirated copies come from handheld camcorders in movie theaters. And an ATT Labs study shows that 77 percent of movies on P2P services were leaked by movie industry insiders

Given our concerns over the potential chilling effect of such legislation on technology, devices, and consumers, we cannot at this time endorse a legislative approach of the nature of any put forward to date. In addition, we would have these concerns about any mandate proposal:

- Any technical terms, and their consequences, must be absolutely clear and well understood.
- The mandated technologies, their effects in the marketplace and on consumers, and the entire terms under which they would be available to makers of the covered products must be similarly well understood.
- Mandating the use of the technology should not harm technological progress or unduly burden legitimate products.
- It is no longer enough that, as we have previously insisted, a mandate must be accompanied by "encoding rules" that protect a consumer's right to make private, noncommercial recordings at home. Any mandate legislation also needs to protect, specifically, the consumer's right to search for, index, store, and play back any home recorded content, in the desired order -- just as consumers do with their personal video and audio recorders today.

Any "Analog Hole" Bill Is About Copy Protection of In-Home Recordings

The aim of any "analog hole" mandate would be to impose on in-home products with analog interfaces the same "DRM" in-home copy protection rules that apply to digital in-home interfaces, in addition to preventing Internet redistribution. Since

effective protection of an analog signal cannot be done by license, the only way to do this is by requiring that any device receiving the analog signal must be subject to a legal mandate governing (1) its potential conversion to digital, and (2) that the applied "coding" not be stripped off or changed, even in the absence of such "A / D" conversion. This can only be accomplished by a mandate potentially covering every component and every piece of software capable of digitizing or changing analog video signals, and on every digital device capable of storing such signals.

Thus, the "analog hole" issue affects more than just free, over the air broadcasts. Every set-top box from a cable or satellite service has analog outputs for HDTV and / or standard definition video. For about the first five years that HDTV was available, the "component analog" interface was the only way of moving an HDTV program from a set-top box to a device that could display HDTV.[1]

Content owners have been concerned that, in the future, consumers may be able to tap the analog outputs of set-top boxes to digitize and record programs, including content that otherwise might classified as "no copy" material under applicable "encoding rules."[2] To help explore whether addressing this issue might be feasible, HRRC and CEA and their members participated in a work group of the Copy Protection Technical Working

[1] This interface is still probably the way a majority of U.S. cable and satellite subscribers receive HDTV and DTV programming from set-top boxes. Even purely "digital" displays have HD component analog inputs. At present we know of no product in the consumer marketplace that is configured to digitize or record from the Component Analog interface, which involves three separate wires and a great deal of bandwidth.

[2] Examples of "encoding rules" enacted to protect legitimate consumer expectations in the presence of copy control technologies include those in Section 1201(k) of the DMCA and the FCC "Plug & Play" regulations.

Group ("CPTWG").[3] Our experience left us with many open questions, none of which seems adequately addressed by any legislative proposal we have seen to date.

The "Analog Content Protection Act" Illustrates Difficulties Rather Than Solutions

The only available legislative reference is H.R. 4659, the "Analog Content Protection Act" introduced last year in the House by Reps. Sensenbrenner and Conyers. In this bill, and in "stakeholder" discussions since its introduction, we see more problems than solutions:

- The scope of the legislation is so broad that it would be appear to cover just about any component or piece of software code that can function as an "analog to digital converter," in addition to covering the end-product, integrated device.
    - Hardware and software performing this function are found in a great variety of products that have nothing to do with television – airplanes, automobiles, medical devices, PCs, measurement equipment, and many, many, more.
    - Yet, essentially, any such component or software would have to be configured to look for certain codes, and to be licensed and technically equipped to encrypt the output. Devices receiving this output would then have to be licensed and equipped to decrypt it.
    - It is unclear under what circumstances the combination of a hardware component, and downloaded firmware or software, would be considered a single "portion" of a device, as the mandate would be defined.
- One would think that after a decade of study by three industries, the sponsors of legislation would be given a consensus definition of the linchpin of the bill: what is "a covered format"—
    - A definition of this term is essential to defining the scope of the devices to be covered by the technical mandate.
    - Instead, this definition is left to be determined, after enactment, by the Patent & Trademark office.

[3] The CPTWG is an open forum, of which CEA, the MPAA and the Computer Industry Group are the active founding members. Participants in the content, information technology, and consumer electronics industries have met there regularly for more than ten years.

- The inability, after a decade of discussion, to settle on a definition of "covered format," suggests that –
  - The proponents are hesitant to indicate the breadth of the semiconductor components, software, and firmware that would be covered;
  - There is a lack of consensus within or among industries; and / or,
  - Technology is changing so rapidly that the proponents are afraid to enshrine a definition in legislation.

Any of these should be a full stop in considering passage of a mandate.

- Two technologies, "CGMS-A" and "VEIL," would be specified to work in tandem. VEIL is present as a backstop for the stripping out of CGMS-A encoding, which is said to be relatively easy to do. However, the result of the VEIL technology would be to achieve a default "no copy" outcome even where the content provider did not intend to, or should not be allowed to, prevent copying.[4]
  - Although CGMS-A has a long history of actual use in consumer electronics products, the VEIL technology is largely an unknown entity in this respect, particularly as to key concerns such as implementation cost, burdens on devices that would have to detect or preserve it, any intellectual property rights covering the technology and, if applicable, any license terms, fees and conditions for its use.[5]
- There are lengthy "Compliance" and "Robustness" rules on the operation of products containing the covered components. The narrower the definition of covered semiconductor and software components, the tighter the Compliance and Robustness rules on end products would have to be, to assure compliance.
- As in the case of the Broadcast Flag, there would need to be a process to qualify encryption technologies for downstream protection.
  - Unlike the case of the Flag, however, the subject here is not just televisions that process regulated signals, it would be all devices capable of processing an analog signal to produce a digital result.

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[4] While both of these technologies, and others, have been examined in Work Group sessions of the CPTWG, the problems inherent in applying them – including the unacceptable default outcome from VEIL and the difficulty in defining a scope of covered devices – are also very familiar. There is no consensus in the technical community that this combination is appropriate as a mandated solution.

[5] H.R. 4659 has extensive provisions for public scrutiny of licensing terms for improvements in VEIL technology, but contains so such scrutiny requirements as to the mandating of responses to VEIL in the first place.

- This raises issues as to how many such technologies should be qualified; how such a great variety of converter components might operate with a great variety of decryption devices, and whether the operation of some non-TV products – either intentionally or by mischief – could be brought to a sudden and disastrous halt.

- Many other elements of the legislation are left vague or punted to some future consensus –
  - the meaning of "associated software,"
  - the precise obligation on "analog to analog" conversion devices;
  - the meaning and scope of the exemption for "professional devices" (does this include "components" and "software"?);
  - whether there is a "professional" exemption for "circumvention" activity;
  - what the robustness rules mean by referring to a device that is "solely capable of playing and can't be modified"?

In summary, drafters of this sort of legislation are on the horns of a dilemma: Make it very specific, and the Congress will have established a technical mandate that could constrain technology, competition, and consumers for decades. Leave discretion to an administrative body, later, and the Congress will have simply postponed decisions that the private sector – for good reason – has been unable to resolve for a decade. It is not clear, in this case, what policy basis or preparation would equip the PTO to make these decisions, or who would exercise oversight over its judgments.

The Implications Are Much Broader Than Those Of The Video Broadcast Flag

We should emphasize that this is not the Broadcast Flag, in which there was no attempt to impose in-home copy protection constraints on any product with an A / D converter, and which did apply only to well-defined TV receiver circuitry that was already the subject of longstanding technical standards, and in which there was no attempt to impose design constraints at very specific component or software levels. (And even so, the Broadcast Flag remains controversial.)

At an inter-industry technical work group in 2004, Dr. Randy Cole of CEA member Texas Instruments made a presentation about the difficulties of trying to define and impose a mandate on the sort of semiconductor and software devices that now comprise the market. Recently he updated his analysis for consideration by Committee staff. We herewith submit it and ask that it be included in the record.

Is This Mandate Necessary?

Any "Analog Hole" legislation would be primarily about private, noncommercial, in-home conduct of the sort that consumers have been accustomed to for decades, and would cover anything with an analog input that can process video signals. In addition to answering all the questions that we and others have about the prospect that such legislation could do more harm than good, proponents should also have to demonstrate that, in light of the potential for unintended consequences, it is truly necessary.

CEA and HRRC have, in good faith, discussed the idea of "analog hole legislation" with motion picture industry representatives because (1) we recognized their desire for "rules" that would apply across all platforms, if possible, (2) they were willing to work with us on "encoding" rules to protect consumers' fair use abilities to record, store, and play back content for use in the home and among family groups, and (3) we want to avoid truly harsh impositions on consumers, such as "Selectable Output Control" or "downresolution" of analog outputs.

* * *

Finally, we must not ignore the overarching issue of technological progress and U.S. competitiveness. While other countries are busy developing their technology industries in order to compete more efficiently with the United States, on several fronts

we face proposals from the content community to suppress technological development on arbitrary or insufficient bases. This is a trend that ought not to be encouraged.

Again, thank you, Mr. Chairman, for the opportunity to appear before this Subcommittee to address these important issues. We have worked collegially with the content industries when they have been willing to do so. We appreciate being asked to be here today and look forward to working with you and your staff as you examine the important issues that have been raised for discussion today.

Testimony of Gigi B. Sohn, President
Public Knowledge

Before the
U.S. Senate Committee on the Judiciary

Oversight Hearing On:
"The Analog Hole: Can Congress Protect Copyright and Promote Innovation?"

Washington, DC
June 21, 2006

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Chairman Specter, Ranking Member Leahy and other members of the Committee, my name is Gigi B. Sohn. I am the President of Public Knowledge, a nonprofit public interest organization that addresses the public's stake in the convergence of communications policy and intellectual property law. I want to thank the Committee for inviting me to testify on the question of how the analog hole impacts copyrights and innovation. I specifically want to focus my remarks on the impact of government-mandated efforts to close the analog hole on consumers.[1]

Introduction and Summary

This is the digital golden age for consumers. They have numerous choices for buying digital content and for buying devices on which to play that content. Equally as important, they have numerous choices for creating their own content. User-generated content is driving our culture, our democracy, and increasingly, our economy. Indeed, a recent Pew Internet and American Life study[2] showed that a full 57% of young people produce their own content, be it

[1] I would like to thank Public Knowledge interns Bill Herman, Chris Johns and Tim Schneider for assisting me with this testimony.
[2] "Teen Content Creators and Consumers" can be found at: http://www.pewinternet.org/PPF/r/166/report_display.asp

blogs, movies or music. As Professor Lawrence Lessig said at a recent Princeton University Conference, our culture has gone from one of "Read-Only" to "Read-Write."

The ability of consumers to enjoy lawfully acquired digital and analog content and create their own content is dependent upon the analog hole, that is, the ability to convert analog content to digital. Popular consumer electronics devices like the TiVo and the Slingbox[3] use the analog hole to operate. Consumers use the analog hole to take old home movies and videotapes and transfer them to longer-lasting digital media. The ability of consumers to benefit from the analog hole has resulted in great economic benefits for our country – the sales of consumer electronics devices, computers and digital media, both pre-recorded and blank, are booming.

Yet Hollywood is asking Congress to help it close the analog hole. I will not mince words – this would be profoundly anti-consumer and a radical change in the historic copyright balance. Closing the analog hole would immediately restrict lawful uses of technology and make millions of consumer devices obsolete. It would not be far-fetched to predict that closing the analog hole will cause a consumer backlash with ramifications for device manufacturers, retail stores, content producers and Congress.

Moreover, Hollywood has not clearly defined the problem it wants to fix. They have provided no evidence that use of the analog hole has resulted in any significant copyright infringement. The mere fact that a consumer can buy an analog to digital converter device is not evidence that such a device is being used illegally any more than the sale of kitchen knives indicates that they are being used for stabbings. If the concern is that certain individuals are taking analog content, digitizing it and placing it on peer-to-peer networks, then the answer is not

[3]For the uninitiated, the Slingbox is a device that permits you to watch your local TV shows and recorded shows on a laptop computer anywhere in the world.

to close the analog hole, but to use the many legal, technological and marketplace tools the industry has at its disposal to combat illegal use of those networks.

Closing the analog hole is the third technology mandate the content industry has sought from Congress, along with the video and audio flags, which are now part of communications reform legislation in this chamber. For none of those three has the content industry demonstrated 1) evidence of the harm that they seek to resolve with a tech mandate or 2) that the alleged harm outweighs the harm to lawful consumer uses of media and technology. I would urge this Committee and Congress to insist upon an "environmental impact" statement before it imposes technology mandates that will further tip the copyright balance away from consumers.

Closing the Analog Hole Would Have Grave Consequences for Consumers

Consumers rely on analog connections to use the media devices they own. DVD and CD players, iPods and Digital Video Recorders (DVRs) like TiVo all use analog connections to connect to other devices. For example, to use your DVD player, you merely plug it into your TV set using inexpensive analog cables. This is the "analog hole" that Hollywood wants to close.

An analog to digital converter is one of the most basic pieces of electronics in use today. These units are found in devices we don't even think twice about – from electronic bathroom scales to digital thermometers. Put most simply, an analog to digital converter is anything that takes an analog signal (like sound, temperature, or light) and converts it into a digital signal. Cellphones, computers, televisions, and video game consoles all use analog to digital converters to operate.

Thus, it should come as no surprise that a large number of lawful consumer activities would be affected by legislation closing the analog hole. For example, time and place shifting, such as recording television shows onto a computer, or moving recorded content from one device over a home network, would be prohibited, as would excerpting a DVD for a PowerPoint or multimedia presentation. The ability to transfer content that one lawfully buys from one device to another has helped to drive the huge market for content and devices. Closing the analog hole will limit this ability and with it consumers' enthusiasm for purchasing these products.

Closing the analog hole will not only affect future devices, it will also affect the billions of dollars of consumer electronics devices that are already in people's homes. Devices that are purchased before an analog hole mandate goes into effect may not work with devices purchased after. For example, the television you own now may not work with the DVR you buy after the analog hole is closed. There is no transition period and no converter device to solve this. Recent consumer electronics sales numbers demonstrate the breadth of this problem:

- **Televisions:** In 2006, $23 billion worth of televisions will be sold[4] - $18 million of that figure will be spent on digital televisions. As of 2005, there was a nationwide total of 287 million TVs[5], and an estimated population of 295 million[6] – nearly one television for every resident.
- **DVD Players:** The Digital Entertainment Group, a trade consortium dedicated to promoting the DVD technology, reports that 37 million DVD players were sold last year; nearly 80% of U.S. households currently have DVD players in their homes – that's 169 million DVD players.[7]
- **Digital Video Recorders:** One of the fastest growing consumer electronics devices is the Digital Video Recorder (DVR). In 2005, 19 million DVRs were sold worldwide.[8]

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[4]Ibid.
[5]Television Bureau of Advertising: <http://www.tvb.org/nav/build_frameset.asp?url=/rcentral/index.asp>.
[6]U.S. Census: <http://www.census.gov/prod/2005pubs/06statab/pop.pdf>.
[7]The Digital Entertainment Group: <http://www.dvdinformation.com/Highlights/index.cfm>.
[8]In-Stat Research: <http://www.instat.com/Abstract.asp?ID=162&SKU=IN0603110ME>.

According to recent estimates, 12% of US households have a DVR, a number that is expected to rise to nearly 50% by 2009.[9]

Lastly, as my colleagues from TiVo and the Consumer Electronics Association will no doubt tell you, a technology mandate that will close the analog hole will have tremendous costs for device manufacturers. But it bears notice that inevitably, the consumer will bear much of this cost in increased prices. Thus, closing the analog hole will result in an anti-consumer trifecta – it would 1) limit lawful uses of technology and content; 2) make obsolete millions of devices; and 3) raise the cost of new devices. It is hard to think of a technology mandate that harms the consumer more.

The Analog Hole is the Last Resort for Preserving Fair Uses Prohibited by the DMCA

As this Committee knows, the Digital Millennium Copyright Act has been an embattled law since its passage in 1998. One of the primary reasons for this has been the effect of its anti-circumvention provisions on fair use. 17 U.S.C. § 1201(a)(1)(A) prohibits circumvention of access controls for any reason, including lawful uses like fair use.

The analog hole is an important backdoor solution to this problem. If I want to make a fair use excerpt of a movie on DVD to use in a presentation, I cannot lawfully break the encryption to do so. Instead, I must either hold up a video camera to the TV screen, or connect that camera to the DVD player's analog outputs. Without the analog hole, teachers, students, journalists and ordinary consumers seeking to comment upon, criticize, or otherwise lawfully use a portion of a digitally protected copyrighted work have no recourse under the law. This capability becomes increasingly important as more and more individuals create their own

[9] iMedia Connection <http://www.imediaconnection.com/content/6516.asp> (citing several industry reports).

content, such as online videos and video blogs (so called "vlogs") that comment on news and entertainment programming.

Indeed, both the U.S. Copyright Office and the Motion Picture Association of America (MPAA) have said that the analog hole should be the only way for consumers to be able to engage in fair use of protected digital media. In its 2003 Triennial Review ruling, the Copyright Office dismissed a proposed Section 1201(a)(1) exemption for "ancillary works distributed on DVDs encrypted by CSS."[10] This exemption was proposed on behalf of movie critics who sought to reproduce short clips for purposes such as criticism and commentary: purposes explicitly enshrined in the statute preserving exemptions for fair use.[11] Although the Copyright Office acknowledged that important fair uses were at stake,[12] it nonetheless rejected the proposed exemption, and preserved the ban on circumventing DVD encryption. An important part of their reasoning was that users could rely on analog hole solutions to achieve the desired results without circumvention. The Copyright Office urged would-be fair users either to use their DVD player's analog output or to point their video camera at their television and tape the movies in question. Thus, the Copyright Office denied the exemption request "[b]ecause users already have access to an analog copy of the work, they have the ability to engage in the desired activity."[13]

The Copyright Office was not the first to suggest that would-be fair users use the analog hole to record protected digital media. In 2003, Fritz Attaway, the MPAA's Executive Vice

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[10] Letter from Marybeth Peters, Register of Copyrights, to James H. Billington, Librarian of Congress, 115 (Oct. 27, 2003), http://www.copyright.gov/1201/docs/registers-recommendation.pdf [hereinafter 2003 Recommendations].
[11] 17 U.S.C. § 107.
[12] 2003 Recommendations, *supra* note , *at* 116. "There is little doubt that the desired use for comment and criticism by weblog critics can be within the fair use exception." *Id.*
[13] *Id.*, *at* 116.

President, specifically advocated this as a solution to the needs of fair users,[14] and made the same argument again in this year's Triennial Review.[15] In both instances, he demonstrated the process at Copyright Office Hearings.

While we have stressed the negative impact that closing the analog hole would have on consumers, the Copyright Office's 2006 hearings show that educators also depend on the analog hole. Public Knowledge intern Bill Herman, a Ph.D. candidate at the University of Pennsylvania's Annenberg School for Communication, testified on April 3 in support of the two proposed exemptions that would allow professors to circumvent the copy controls on DVDs in order to make lawful uses of materials in the classroom.

As part of his testimony, Mr. Herman conducted a brief online survey of several dozen professors and instructors in fields such as communication and media studies. This is a small sample of a very large population of classroom instructors who use regularly use video materials in the classroom. He found that a majority of these educators use analog hole solutions, either capturing the signal from the analog output on their DVD player or videotaping their television—exactly as Mr. Attaway suggested they should. Virtually none of them thought that this was a good solution; they would all rather use a perfect digital copy. But rather than violate the DMCA, these educators used the analog hole to make the most efficient and effective use of their class time. Further, Mr. Herman testified that the only way to avoid this problem entirely would be to buy extra equipment at a cost of thousands of dollars per school and millions for the

[14] Fritz Attaway, Executive Vice President and Washington General Counsel, Motion Picture Association of America, testimony before the Copyright Office, May 2, 2003, *at* 69-70, *available at*: http://www.copyright.gov/1201/2003/hearings/transcript-may2.pdf.
[15] Fritz Attaway, testimony before the Copyright Office, April 3, 2006, *at* 56-57, *available at*: http://www.copyright.gov/1201/2006/hearings/transcript-april03.pdf.

education sector as a whole.[16] Thus, the analog hole not only serves to preserve the rights of consumers—it gives teachers a legal way to save millions of student-hours and millions of dollars.

Proposed Legislation to Close The Analog Hole Would Harm Consumers

Last year, H.R. 4569, the Digital Transition Content Security Act of 2005 (DTCSA) was introduced in the House of Representatives. I urge the Senate not to introduce this or any other similar legislation to close the analog hole. In addition to the problems discussed above, which would result from any effort to close the analog hole, H.R. 4569 also suffers from a number of maladies specific to its substance: the mandated use of two specific protection technologies, encoding rules which would limit lawful uses, and bureaucratic oversight of technology by an inexperienced and overworked Patent and Trademark Office.[17]

A. The DTSCA Would Mandate an Unproven and Disputed Technology

The DTSCA requires the use of two technologies that have never been used in conjunction before: CGMS-A, an encryption technology, and VEIL, a watermarking technology. While CGMS-A is an established standard that is in use in some consumer electronic devices, it is by no means widespread. VEIL technology has only previously been used for toys that interact with Batman cartoons.[18]

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[16] Bill D. Herman, Testimony on April 3, 2006, pp. 23-24, available at: http://www.copyright.gov/1201/2006/hearings/transcript-april03.pdf.

[17] Another concern is the enormous penalties for non-compliance with the robustness standards. TiVo addresses this topic in full in its testimony at p. 6.

[18] See http://www.veilinteractive.com/.

While the CGMS-A + VEIL technology was discussed at the Analog Hole Reconversion Discussion Group, a standards group with both industry and public interest participation, it was quickly dismissed as not worthy of further consideration. Thus, this technology has not been fully vetted by industry and public interest groups. If Congress feels it must do something about the analog hole, at a minimum, it should refer the technology back to industry and public interest groups so CGMS-A + VEIL can be thoroughly analyzed for its impact on consumers and costs to technology companies. In the complete absence of any such review, the imposition of such a detailed technology mandate would be unprecedented.

B. The DTSCA's Encoding Rules Would Limit Fair Use

The DTSCA would impose a detailed and complex set of encoding rules that would restrict certain lawful uses of content. The bill includes tiered levels of restriction based on the type of programming (*e.g.*, pay-per-view, video on demand) that would permit, in most cases, the making of one copy, and in some cases not permit any copies. Moreover, the encoding rules would limit time and space shifting, including the copying of a program from one DVR to another, or the copying of a television program to a portable computer. This upsets the balance established in copyright law between the needs of copyright holders and the rights of the public, by placing far too much control over lawful uses in the hands of the content producers.

C. The Patent and Trademark Office is Ill-Suited to Oversee Analog Hole Compliance

The DTSCA would delegate significant regulatory authority over analog hole compliance issues to the inexperienced and overworked US Patent and Trademark Office (PTO). That authority would include drafting, adopting, and enforcing robustness requirements for analog

video input devices, rules for approval of authorized digital output devices, rules for approval of authorized digital output and recording technologies, approval of changes to VEIL, and rules for control of downstream devices. As discussed above, devices and software that could be used to convert analog video signals into digital video signals are common, not just in consumer electronics and personal computers, but in microchip or software form embedded in a variety of devices. The DTSCA makes no distinction. Even if the Act governed only consumer electronics, it would still require the PTO to monitor the entirety of an ever-growing industry and approve not only specific copy protection technologies, but business models as well.

The PTO is particularly ill suited to take on this role. It has never engaged in this kind of oversight, and has struggled for years to keep up with its most important and core duty: examining patent and trademark applications. The backlog of patent applications[19] and the questions surrounding patent quality are well documented.[20] Not only would a new analog hole approval process cost the government untold millions of dollars each year, but the additional bureaucratic bottleneck would hinder technological innovation and further slow the already backlogged patent approval process.

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[19]Hon. Jon W. Dudas, Deputy Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office, testimony before the Subcommittee on Intellectual Property, Senate Committee on the Judiciary, April 25, 2005, *available at*: http://judiciary.senate.gov/testimony.cfm?id=1475&wit_id=2495. "While the volume and technical complexity of patent applications have increased significantly, our capacity to examine patent applications has not risen at the same rate. The result is a pending-application backlog of historic proportions." *Id. See also* U.S. Patent and Trademark Office, *Performance and Accountability Report for Fiscal Year 2005*, *at*: http://www.uspto.gov/web/offices/com/annual/2005/2005annualreport.pdf (citing an average patent pendency of 29.1 months).

[20]Eugene R. Quinn, Jr., *The Proliferation of Electronic Commerce Patents: Don't Blame the PTO*, 28 RUTGERS COMPUTER & TECH. L.J. 121, 123 (2002). "[P]atent examiners are simply too overworked and do not have the proper resources to examine patent applications in a manner likely to result in the weeding out of patents that ought not see the light of day." *Id. See also, e.g.*, Katherine M. Zandy, *Too Much, Too Little, or Just Right? A Goldilocks Approach to Patent Examination Reform*, 61 N.Y.U. ANN. SURV. AM. L. 865, 868. "[A] wide range of patents are granted that fail to satisfy the requirements of novelty, nonobviousness, and utility." *Id.*

Hollywood Has Not Shown that the Analog Hole is the Source of its Piracy Problems

Public Knowledge takes indiscriminate redistribution of digital content seriously; indeed, we have supported both content industry lawsuits against large-scale infringers using P2P software and the use of marketplace-based (as opposed to government mandated) technological protection measures.

Public Knowledge also believes that government should not legislate in the absence of evidence of a problem that can be solved by the proposed legislation. This is just such a case: Hollywood has not demonstrated that even one case of indiscriminate redistribution of its work was the result of analog to digital conversion. Its "evidence" usually relies on the existence of inexpensive analog to digital conversion devices, which they proudly hold up at panel discussions and at hearings. But the mere existence of these devices does not prove that they are being used for anything other than the lawful uses described above.[21]

Indeed, it appears that the problem Hollywood seeks to fix is caused not by use of the analog hole, but by the use of computers and digital networks. Infringement facilitated by those technologies is already being addressed by a wide range of recently developed legal and marketplace tools, including:

- *The Supreme Court's decision in MGM v. Grokster and its aftermath.* The Supreme Court gave content owners a powerful tool against infringement when it held that manufacturers and distributors of technologies that are used to infringe could be held liable for that infringement if they actively encourage illegal activity. As a result, a number of commercial P2P distributors have gone out of business, moved out of the U.S., or sold their assets to copyright holders.

[21]The study that the MPAA relies upon in support of closing the analog hole has been criticized because it counts private copying – much of which is legal – as infringement. Ken Fisher, The problem with MPAA's shocking piracy numbers, ARS Technica (June 5, 2006), at http://arstechnica.com/news.ars/post/20060505-6761.html

- *Lawsuits against mass infringers using P2P networks.* Both the RIAA and the MPAA continue to sue individuals who are engaged in massive infringement over peer-to-peer (P2P) networks. By their own admission, these lawsuits have had both a deterrent and educative effect. The RIAA now characterizes the P2P problem as "contained."[22]

- *The Family Entertainment and Copyright Act.* The FECA gave copyright holders a new cause of action to help limit leaks of pre-release works and made explicit the illegality of bringing a camcorder into a movie theater. It also provided for the appointment of an intellectual property "czar" to better enforce copyright laws.

- *Agreements by ISPs to pass on warning notices.* The war between Internet Service Providers and content companies has cooled. Last year, Verizon and Disney entered into an agreement by which Verizon will warn alleged copyright infringers using its networks, but will not give up their personal information to Disney. Officials at Verizon have informed me that they are considering similar arrangements with other content companies.

- *Increased use of copy protection and other digital rights management tools in the marketplace.* There are numerous instances of the use of digital rights management tools in the marketplace. iTunes Fairplay DRM is perhaps the most well known, but other services that use DRM include MSN music and video, Napster, Yahoo Music, Wal-Mart Music Downloads, Movielink, CinemaNow and iBeam. The success of some of these business models are a testament to the fact that if content companies make their catalogs available in a simple, flexible and reasonably-priced manner, those models will succeed in the marketplace without government intervention.

These tools are in addition to the strict penalties of current copyright law, including the DMCA. To the extent that the content industries are looking for a "speed bump" to keep "honest people honest," I would contend that many such speed bumps already exist, while more are being developed every day without government technology mandates.

Finally, by far the most effective means of preventing massive copyright infringement involves the content industry doing what it took the music industry far too long to do[23] – satisfy

[22] Jefferson Graham, *RIAA Chief Says Illegal Song-Sharing "Contained"*, USATODAY.COM, June 12, 2006, at: http://www.usatoday.com/tech/products/services/2006-06-12-riaa_x.htm.

[23] See Keynote Address of Edgar Bronfman, Chairman and CEO of Warner Music at http://www.tvworldwide.com/events/pff/050821/agenda.htm. "The Music Industry, like almost every industry faced with massive and rapid transformation first reacted too slowly and moderately, inhibited by an instinctive and reflexive reaction to protect our current business and business models."

market demand by allowing consumers to enjoy fair and flexible access to content at reasonable prices (inevitably produced in a free market). DVDs are the best example of the market working. There, a government mandate –the Digital Video Recording Act – was rejected. Instead, the industry developed and adopted a protection system designed to "keep honest people honest." Despite the fact that the protection system was defeated long ago, the DVD market has grown at an astounding rate – from zero in 1997 to $25 million in sales and rentals last year. Moreover, as I noted above, many other new digital music and video distribution models, developed with content industry support and industry-agreed upon content protection, are emerging in the market. We believe that these efforts make government intervention in the free market unnecessary.

Conclusion

I want to again thank Chairman Specter, Ranking Member Leahy and the other members of the Committee for giving me the opportunity to present the viewpoint of consumers. Let me close with this thought. When Congress was considering the DMCA eight years ago, the content industry assured legislators that this would be the last law that they would seek to limit consumers' lawful uses of digital media. But in the four Congress' since then, we have seen proposed law after proposed law and numerous lawsuits to further limit consumer rights and innovation and impose restrictive costs on the technology sector. In this Congress alone, no

fewer than five bills total in both houses[24] would tip the copyright balance even further towards the content industry.[25] This is nothing more than carefully planned assault on consumers.

The Senate should not compound this effort by legislatively mandating technologies to close the analog hole. Such a mandate is premature, unnecessary and would cause great consumer cost, confusion and inconvenience. Before it acts, Congress at a minimum should require evidence that analog to digital conversion is a significant source of infringement, and that the harm to Hollywood outweighs the clear detriment to consumers.

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[24]They include H.R. 4569, discussed at pp. 9-12, above; S. 2644, H.R. 5361 and H.R. 4861 (limiting consumers' ability to record radio transmissions for personal use); and S. 2686 (limiting consumers' ability to lawfully use digital television transmission and to record radio transmissions for personal use).

[25]In addition, two lawsuits have recently been filed by the content industry intended to limit certain uses of digital technology. Several major movie studios and television broadcasters have sued Cablevision for providing a network-based TiVo-like service, and the major record labels have sued XM radio for permitting consumers to record blocks of programming time and disaggregating them. In each case, the plaintiffs are seeking to force the technology providers to pay an extra licensing fee.

Opening Statement of Chairman Specter
Senate Judiciary Committee
"The Analog Hole: Can Congress Protect Copyright and Promote Innovation?"
June 21, 2006

Good morning ladies and gentlemen and welcome to today's Judiciary Committee hearing titled, "The Analog Hole: Can Congress Protect Copyright and Promote Innovation." The Committee has convened today's hearing to revisit, for the third time this Congress, the inherent tension created by our copyright laws in protecting creative works while encouraging technological innovation. The Committee examined these competing concerns during the *Grokster* hearing last September and most recently during an April hearing to cast the public spotlight on digital radio services. Today, we look at the so-called "analog hole" -- a term that describes an existing technological loophole that may undermine copyright protection efforts against the piracy of this country's visual creations.

The emergence of digital technologies presents the owners of movies, television programs, and other visual content with exciting opportunities to reach a truly global marketplace. Consumers can rent the last 3 seasons of the television hit "24" over the mail, watch feature films on their computers via the internet, or purchase classic sports match-ups with the click of a button over satellite networks. Digital technology has translated into greater access for consumers and unlimited market opportunities for a creative commodity that has helped defined American culture in the past century.

But some argue that a darker side has possibly emerged with this same digital technology. Today, intellectual property thieves can duplicate near perfect copies of movies for sale in open black markets throughout the world. While content owners have developed anti-copying technologies, the "analog hole" enables thieves to circumvent these protections. The so-called

"analog hole" creates a loophole in copyright protection by stripping protected digital content of its copyright protections in the analog conversion process necessary for consumers to view the video programming on their television sets. When the analog content is reconverted to a digital format, it no longer contains the original copyright protections, thereby allowing for the unauthorized mass distribution of digital content. This presents an obvious problem for the content holders and yet another obstacle in our country's fight against global piracy.

Efforts to close the analog hole have brought content owners together with the computer software and consumer electronics industry in search of a solution. Although both sides continue in their discussions, the content owners have recently enlisted the help of Congress in the form of legislation introduced in the House last December by Chairman Sensenbrenner. This bill would compel manufacturers to implement a technological "fix" mandating the recognition and preservation of content protections in the analog reconversion process. I am always weary of the government mandating a technological fix and believe that the parties should be brought together to come up with a mutually palatable solution. As such, I have sought to encourage negotiations by holding an initial stakeholder roundtable on this issue earlier this month. It is my hope that the stakeholders will find a way to unentrench themselves from historical positions and work with me and the members of the Committee to reach a mutually agreeable solution in such future meetings.

We hope today's hearing will shed light on the underlying problem and competing concerns raised by proponents and opponents about a measured solution to close the analog hole. I want to thank all of you for coming today and I look forward to your testimony. I now turn to the Ranking Member, Senator Leahy, for his opening remarks.

Before the
Senate Committee on the Judiciary

The Analog Hole: Can Congress Protect Copyright and Promote Innovation?

June 21, 2006

Testimony of Matthew Zinn
Vice President, General Counsel, and Chief Privacy Officer
TiVo Inc.

Chairman Specter, Ranking Member Leahy, and other members of the Committee, my name is Matthew Zinn. I am Senior Vice President, General Counsel, and Chief Privacy Officer at TiVo. I want to thank the Committee for inviting me to testify about the analog hole and its impact on innovators, consumers, and content providers. As a leading innovator in creating products that permit consumers to enjoy legitimately-acquired content when and where they want to enjoy it, TiVo understands and is sensitive to the interests of content owners in protecting their intellectual property rights. But TiVo also is sensitive to the needs of consumers, who want to preserve their ability to make flexible uses of legally-acquired content. I want to thank the Committee for giving me the opportunity to present TiVo's concerns about this proposed legislation, which could severely inhibit the ability of innovators to create new products and impair the rights of consumers to use legitimately-acquired content in the manner to which they have become accustomed.

Founded in 1997, and located in Alviso, California, TiVo pioneered a brand new category of products with the development of the first commercially available digital video recorder (DVR). Sold through leading consumer electronics retailers, TiVo has developed a brand that resonates boldly with consumers as providing a superior television experience. With a continued investment in its patented technologies, TiVo has and is continuing to revolutionize the way

consumers watch and access home entertainment. Rapidly becoming the focal point of the digital living room, TiVo's DVR is at the center of experiencing new forms of content on television, such as broadband delivered video, music, and photos.

Summary

TiVo has invested millions in research and development to create hardware and software products for consumers, and has protected this investment by securing its intellectual property rights in these products. Protecting intellectual property rights from infringement and piracy is something TiVo takes very seriously. Indeed, if people can get television content for free from services or sources that compete with TiVo, they won't need to use the TiVo service. TiVo is supportive of the studios' fight against piracy, and has demonstrated this support by creating a robust copy protection system that prohibits users from engaging in indiscriminate redistribution of content. In fact, in the broadcast flag proceeding, the MPAA acknowledged that TiVo's TiVoGuard® copy protection system "appears to contain a strong level of security, including well vetted algorithms and a well designed multi-layer security architecture." However, TiVo does not believe the House of Representatives' proposed analog hole legislation will stop or even reduce piracy, because the conversion of content from an analog format into a digital format without copy restrictions is not the cause of the studios' piracy problem. Rather, TiVo fears that this legislation, which calls for adoption of an unproven technology, is, in reality, merely a way for the studios to try to exercise more control than ever over consumers' use of lawfully-acquired content, all at the device manufacturers' expense.

No Demonstrable Correlation Has Been Shown Between the Analog Hole and Piracy

TiVo agrees with the studios that content piracy is a serious problem and deserves the attention and cooperation of the consumer electronics, technology, and content industries. TiVo has significantly reduced the risk that pirated content will emanate from a TiVo® DVR by restricting consumers' ability to make illegal uses of content. The studios profess that this type of security is not enough, however, because, theoretically, content can escape through the conversion of content from an analog format into a digital format without copy restrictions, *i.e.*, the so-called "analog hole."

The studios have not demonstrated that the analog hole is contributing in any way to the piracy problem. We have seen no evidence that the studios have suffered even one dollar of lost revenue as a result of the sale of contraband copies of content made through analog-to-digital conversions. In fact, the studios have not articulated the nature of the threat they perceive is created by the consumer analog hole. Is it the threat of indiscriminate redistribution? Is it private copying?[1] These are the problems the studios routinely identify when pursuing legislative control over uses of content, but they have not specifically identified these issues here. Without any proof of the nature and economic impact of the perceived problem(s), this Committee and the consumer electronics and technology industries can only speculate, and speculative problems should not be the focus of far-reaching legislation.

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[1] Indeed, the very study the MPAA points out to justify this legislation (a study that the studios refuse to make publicly available, except in summary form), has been criticized because it counts private copying – much of which is legal under principles of fair use – as piracy:

> "According to the MPAA, it is 'Making illegal copies for self or receiving illegal copies from friends of a legitimate VHS/DVD/VCD.' Thus, the MPAA is counting *personal non-commercial backups* and transformative "ripping" as piracy (ripping including decrypting DVDs so that the content can be moved to a portable player)."

Ken Fisher, *The problem with MPAA's shocking piracy numbers*, ARS Technica (June 5, 2006), *at* http://arstechnica.com/news.ars/post/20060505-6761.html (last accessed June 13, 2006).

In addition, Congress already has spent time addressing these issues in other areas of copyright law where all sides agreed that a problem existed. For example, the Family Entertainment and Copyright Act, which, among other things, criminalizes the use of camcorders in movie theaters, was signed into law in 2005. That legislation was designed to address a tangible, demonstrable problem. But the analog hole is not what pirates use to circumvent copy protected content. In fact, the April 2006 edition of *Maximum PC* magazine devotes more than fifteen pages to describing where consumers can find and how they can use software programs to make digital copies of protected digital content far more conveniently and efficiently than through analog-to-digital reconversion. The analog hole legislation therefore will not solve, nor will it even marginally reduce, the piracy problem. It will, however, impose substantial costs on both manufacturers and consumers (in terms of higher prices and reduced device functionality) while offering no demonstrable benefits in the fight against piracy. It is unwise and inappropriate to discuss potential legislative solutions until the studios specifically can identify the financial impact the so-called analog hole has on their bottom lines, the demonstrable risks the hole poses to their intellectual property rights, and why these effects on them outweigh the extraordinary costs to both manufacturers and consumers.

The Costs Disproportionately Burden the Device Manufacturers

The House's proposed Digital Content Transition Security Act requires device manufacturers to build their machines to respond to a government-mandated technology, meaning that the manufacturers must invest valuable time and substantial resources to protect the studios' intellectual property rights from an unidentified problem, using a technology hand-picked by the studios. The studios, by contrast, do not have to change their conduct or spend significant resources to comply with this legislation. In other words, the studios get all of the

benefits of this legislation, while the device manufacturers bear virtually all of the costs and consumers are deprived of the ability to exercise their fair use rights under copyright law.

Engineering and financial resources are not unlimited, and dollars spent on implementation, royalties, administration and lawyers are dollars not spent on innovation. The consumer electronics and technology industries already are spending hundreds of millions of dollars implementing voluntary video content protection systems, and may have to spend more money and valuable engineering cycles on a government-mandated broadcast video flag system. It makes little sense to require these industries to spend even more of their already limited resources to fix a "problem" that the studios have not shown exists. In addition, because of the necessity for government rulemaking and careful compliance with any government rule, the time to market for new products could be delayed considerably.

Implementation costs are just a fragment of the costs this legislation imposes on the consumer electronics and technology industries. The adoption of the CGMS-A and VEIL signaling systems also could expose device manufacturers to virtually unlimited patent infringement liability. One need look no further than the recent $612.5 million Blackberry patent settlement or the government-mandated V-Chip requirement (which appears to require either the use of a patented technology that the FCC did not anticipate or an expensive work-around) to see the huge potential risk a government-mandated technology imposes on device manufacturers. Yet the proposed analog hole legislation offers no assurances to the manufacturers that they will be protected from these risks (*e.g.*, in the form of a dedication to the public of, or a compulsory license for, all the patents necessary to use the technologies at issue). Many companies understandably will be unwilling and/or unable to absorb these costs. This means, at a minimum,

such potential exposure likely will chill innovation in creating new devices or improving old models for legitimate consumer acquisition and enjoyment of content.

The statutory penalties add to the already substantial burdens and risks the analog hole legislation would inflict upon the device manufacturers. H.R. 4569 essentially would give content providers a nuclear weapon to use as a threat against any device manufacturer that wants to incorporate features that would increase consumers' flexible and legal uses of content. The proposed penalties are potential death sentences for corporate entities (*e.g.*, with statutory damages of up to $2,500 per device, a manufacturer that builds one million devices that did not comply with the yet-to-be-promulgated robustness standards could be liable for $2.5 billion in damages). The penalties proposed in H.R. 4569 do ***not*** mirror the civil and criminal penalties of the Copyright Act, which does not make violating robustness rules a copyright violation.[2] For the first time, a manufacturer could be held liable for failing to build a product according to a government-mandated robustness standard, including the possibility of criminal sanctions. No other provision of the Copyright Act subjects device manufacturers to potential criminal liability merely for manufacturing or distributing an otherwise lawful device that a consumer uses to infringe someone else's intellectual property rights.

Finally, when consumers' legitimate use of content is circumscribed by the effects of an overreaching content protection mandate, as would be the case here, the device manufacturer alone loses consumer goodwill, even where the manufacturer has complied with the government's rules. If a TiVo® DVR fails to record or permit the consumer to time- or place-

[2] Even in the event the Copyright Act's civil and criminal provisions were substituted, the statutory damages, at up to $150,000 per work, also could be a death penalty against a manufacturer. It should be noted that under HR. 4569, content providers would not be subject to any penalty for failure to comply with the encoding rules or failure to properly insert CGMS-A. Failure to comply would mean that consumer could not record or time/space-shift content that even though the consumer is permitted to do so under the proposed rules.

shift a favorite television show, regardless of the reason, the consumer will blame TiVo. The consumer will not blame the studio that produced the show, the broadcaster responsible for transmitting it, or the technology company that created the analog hole "protection" system. It is TiVo that will receive the irate service call, and will bear the costs of that call when a consumer misses his or her favorite show, and it is TiVo's reputation that will suffer as a result.

VEIL Has Not Been Vetted in a Multi-Industry Forum

The House-introduced Digital Content Transition Security Act would require manufacturers of analog video input devices to adopt the unproven VEIL watermarking technology, which VEIL readily admits was designed for toys. As discussed above, the adoption of this new technology would impose substantial costs on device manufacturers. Yet the companies that would be required to absorb these costs have not even been given the opportunity to examine the nature of the purported threat, let alone an opportunity to test and evaluate the technology and compare it to the many other potential solutions. For any technology involved in a content protection system to have a chance of success, it must first be tested, reviewed, and selected in a cross-industry setting. This is how these affected industries have proceeded in the past with respect to the adoption of industry-wide copy protection systems, most notably the Content Scramble System (CSS) used to protect DVD content.[3] As a result of review and approval of CSS by all affected parties, the industries established a content protection system that permitted the studios to earn more than $25 billion in sales and rentals last year from zero in 1997.

[3] It is important to note that CGMS-A and VEIL are ***not*** content protection systems. They are merely signaling systems designed to carry copy control information (CCI). Thus, the scope of H.R. 4569 and the delegation of regulatory authority, would be broad, touching many devices, components, and software – not just the detection of CGMS-A and VEIL signals.

The resources already are in place to undertake such review of the purported problem and the VEIL proposed solution, as well as competing technologies. Each of the affected industries participates in the Content Protection Technical Working Group (CPTWG), an organization formed specifically to examine these types of issues. CPTWG was responsible for thoroughly vetting CSS and the broadcast flag, and has both a proven track record and existing resources to engage in open and productive examination of the technologies in question. In fact, CPTWG already initiated such a process. In 2003, CPTWG chartered the Analog Reconversion Discussion Group (ARDG) to catalog technologies potentially relevant to addressing content protection issues arising from the analog-to-digital reconversion of protected video content. ARDG cataloged at least nine different technologies; but the content industry never followed up with ARDG to discuss the next steps in examining and possibly adopting one of these technologies. Instead, the studios unilaterally selected one of these technologies – VEIL. The studios now ask Congress simply to mandate the adoption of that technology by all device manufacturers, while leaving the manufacturers with the exclusive responsibility for all costs and risks associated with such adoption.

In promoting this legislation, the studios also have overlooked the fact that manufacturers will be required to adopt different technologies in order to address the analog hole in other content protection systems. For example, in the voluntary license agreement for the Advance Access Content System (AACS) content protection system, which is used in connection with high capacity optical media (HD DVD and Blu-ray), the AACS licensing administrator has adopted Macrovision as its analog-to-digital signaling technology of choice. This undermines the studios' purported goal of assuring that manufacturers do not need to configure their devices to respond to a multitude of rights signaling technologies. By allowing the affected industries to

thoroughly vet the technologies at issue, the parties would be assured the issue is considered by the right people in the right environment, and that the resulting technology is one that makes the most sense for all the affected parties. In contrast, a legislative mandate requiring device manufacturers to implement a technology unilaterally advocated by the studios is not an effective or efficient method of addressing whatever issues, if any, may be raised by the analog hole "problem."

The PTO Is Not the Appropriate Agency To Oversee Analog Hole Compliance

The proposed legislation would delegate significant regulatory authority over analog hole compliance issues to the United States Patent and Trademark Office (PTO), an agency singularly unsuited to manage such a task. Already significantly overworked and under-funded, the PTO can hardly manage its statutory obligation of processing patent applications, despite its best intentions. It is an inefficient use of resources to impose upon this agency the responsibility for drafting, promulgating, and enforcing robustness requirements for analog video input devices, rules for approval of authorized digital output technologies and authorized recording technologies, approval of "improvements" to VEIL, and rules for control of downstream devices. Moreover, assuming Congress ultimately authorizes the FCC to proceed with implementation of broadcast flag rules, device manufacturers may be asked to comply with two sets of potentially conflicting rules for the same equipment. By involving the PTO in oversight of copy protection issues, this legislation could make it virtually impossible for device manufacturers like TiVo to comply with all its statutory obligations.

H.R. 4569 Is Overreaching

As discussed above, the studios have provided no evidence to support their contention that the analog hole creates a problem that can be solved by legislation. But even if TiVo did agree legislation was necessary, the sweeping scope of H.R. 4569 far exceeds what the studios need in order to protect their intellectual property rights in their content.

The proposed legislation would regulate "analog video input devices," a definition that essentially includes any hardware product that can read an analog signal and convert that signal into a digital format. The universe of products fitting within that description is quite large, including virtually all computer products. Analog-to-digital converters are simple and inexpensive chips and software programs, and every personal computer therefore will have the capacity to become an analog video input device. If the law is broadly drafted to cover all analog-to-digital components and software, it would increase costs for the manufacturing and software industries and to many consumers not even involved in analog video. In addition, to be effective the compliance and robustness rules would have to cover "downstream devices," further expanding the universe of products affected by this legislation.

Of course, this assumes that any of the devices actually could comply with the robustness rules, which is very much in doubt. The proposed technologies, CGMS-A and VEIL, are not robust or persistent signaling systems. Given the proposed robustness rules, device manufacturers likely will be in violation of those rules as soon as their devices leave the factory. Moreover, because the legislation authorizes criminal penalties for such violations, manufacturers would have little incentive to enter the market or produce innovative products, and some may be forced out of the market altogether.

Finally, and significantly both for TiVo and for its consumers, the legislation clashes with existing principles of copyright law by placing limitations on certain uses of content that currently are considered lawful, such as time- and space-shifting. The very appeal of TiVo's DVRs is that they allow consumers to make legal and flexible personal uses of video content. H.R. 4569 will impose severe limitations on these uses. Under copyright law, TiVo users are not limited in their ability to make copies of recorded content for personal, non-commercial use, to view that content as many times as they want, or to move the content around their homes or to portable devices over a secure network. H.R. 4569 would eviscerate these rights. TiVo users would be allowed to make only a single copy of most content (such as pay television transmissions, non-premium subscription television, and free conditional access delivery content), and no copies of other content (such as pay-per-view, video-on-demand, and subscription on demand content). No longer will consumers be permitted to copy a television program from a TiVo DVR in the living room to one in the bedroom, even though fair use principles of copyright law currently permit them to do so. Likewise, consumers will not be permitted to copy that program to their laptops or other portable devices for later viewing. These are lawful, fair uses of content, and the studios have provided no justification for altering the balance of copyright law. This legislation simply is about the studios exercising control over the consumers' flexible uses of lawfully-acquired content, offered under the guise of fighting piracy.

Conclusion

As an intellectual property owner and a service provider, TiVo understands the need to prevent the theft of valuable content. But this Committee and Congress should focus on protecting content where it needs to be protected. The proponents of H.R. 4569 have demonstrated no tangible losses attributable to the analog hole. Yet they seek to impose

substantial costs (in research and development costs, implementation expenses, and loss of consumer goodwill) and risks (exposure to patent infringement liability, statutory damages, and criminal liability) on device manufactures, while simultaneously limiting the rights of consumers to make flexible uses of lawfully-acquired content. The proponents also have shown that the proposed mandatory technology would solve as yet undemonstrated problems. The Digital Content Transition Security Act is a solution looking for a problem. Until a problem can be clearly identified by a multi-industry forum that concludes government intervention is needed, any legislation should be strongly disfavored. We urge this Committee and Congress to take a hands-off approach, and leave the affected industries to address technology issues themselves.

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