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**To Federal Trade Commission/Department of Justice
Hearings on Single-Firm Conduct**

**University of California at Berkeley,
Haas School of Business,**

January 30, 2007

Introduction

Thank you for that kind introduction and thanks to the Haas School and its affiliates here in Berkeley for hosting this event.

I want to compliment the FTC and the Department of Justice for convening these hearings. While, like many in business we at Broadcom are of course wary of regulation and other governmental and court interventions that may stifle growth and cause inefficiency, we nonetheless recognize the positive role our government has played and can play in facilitating economic growth, efficiency, and innovation, which ultimately is what drives our economy. I thank and commend the FTC and DOJ for taking the time to solicit views from across the spectrum and around the country and hope that what comes out of this process will promote that positive role.

Let me begin by telling you a little bit about the company I have been with since 1998, Broadcom Corporation.

In 1991, a graduate student, Dr. Henry Nicholas, and his professor, our chairman, Dr. Henry Samueli, had a vision of an innovative company that would provide semiconductors – computer chips – to facilitate high speed digital communications for business and consumer applications. In a world where television and cellphones were still analog, no one had heard of HDTV, dial-up modems were considered cutting edge technology, and few even contemplated the potential of

the Internet and today's laptops and handheld devices – these two visionaries saw that the demand for high bandwidth digital communications would skyrocket.

And of course it has.

Broadcom's revenue now exceeds \$3 billion a year. We retain our roots in Southern California, but now have facilities all over the United States and around the world – including several facilities and over 1,250 employees here in the Bay Area.

We continue to focus on semiconductors for high-speed, high-bandwidth applications such as set top boxes for television, Gigabit Ethernet, DSL modems, wireless networking, and cellular phones. We also produce closely-related devices such as digital TV chips and multimedia chips for iPods and cellphones.

Indeed, it is fair to say that – as much as any other party and any other factor – Broadcom silicon has enabled the digital communications revolution that touches each of us every day.

And, we continue to follow the example of our founders. We have built our entire business model around continuing innovation. Our products are state-of-the-art, and Broadcom is a technology leader in every market in which we play. Our engineers are top notch. In fact, of our 5,200 or so employees, more than 3,800 are engaged in R&D, of whom 439 are Ph.D.s. We spend about 49% of our gross profit on R&D, on innovation.

In keeping with the purpose of these hearings, today I plan to talk a bit about real issues that we confront in the high-tech industry in which we operate. These are not “your father's” competition issues. Everyone in this room is keenly aware that the antitrust laws date back to the end of the nineteenth century. So, one overriding theme that I hope you take from my remarks today is that the antitrust laws must not get trapped in traditional analysis or outmoded and dated thinking. They must be dynamic and flexible. With due deference to economic analysis and marketplace realities, our antitrust regime, including that addressing single-firm conduct, must remain robust to deal with the issues of the twenty-first century.

And as we all know, many of those issues revolve around technology and the high-tech industries.

We at Broadcom firmly believe that competition is what makes our innovation economy work. When coupled with a well-educated and highly motivated work force, competition unleashes creative energy – and creativity spawns the amazing innovations that we have seen in just the past decade alone. In the semiconductor industry, competition creates efficiency on a scale greater than anywhere else. The capabilities of today’s high-tech products dwarf those of just a few years ago, yet prices continue to drop.

The antitrust laws serve their most useful role when they promote competition and prevent companies that have obtained a strong position in one area from exploiting it to prevent competition in other areas.

However, before discussing that issue, let me be clear about two things. First, it is important not to penalize innovation by attacking those companies that have achieved strong market positions *solely through innovation*. Indeed, innovation must be encouraged because it is the key to our country’s continued success in the increasingly challenging global economy.

Secondly, it is important that the intellectual property rights attendant to innovation be respected. Our patent system encourages innovation by ensuring that inventors will reap a portion of the economic benefits of their inventions, while, at the same time, sharing those inventions with the public. That is a good thing, and we must not sacrifice it in the name of competition. At Broadcom we hold over 1,900 U.S. patents and have another 5,900 U.S. and foreign patent applications pending. We care deeply about intellectual property rights.

But companies that use the strong positions they have obtained – even if attained by innovation - to close other markets to competition, or that use deception and false promises to obtain their strong position in the first place – are not innovating but rather are standing in the way of innovation. The antitrust laws must address that type of behavior.

Antitrust Issues in Technology Markets

As I said, Broadcom designs and sells computer chips. In today’s highly sophisticated electronic applications, be they computers, cellphones, or cable boxes, no one company produces all of the systems and components for a particular application. In fact, a typical consumer product incorporates chips and

software from a number of different suppliers. In our vernacular, no one company produces “all of the silicon on the motherboard.”

Today, in both hardware and software, “open systems” is the name of the game. Open systems are why we have the PC and the Internet.

Interfaces between one component and another are therefore necessary. Some of those interfaces are specified by standards developed with broad industry participation under the auspices of standard-setting organizations such as the IEEE and ANSI. The highly successful 802.11b and g wireless networking standards fall into this category. The proliferation of Wi-Fi networking, supported by devices from hundreds of manufacturers, demonstrates the power of industry standards arrived at through non-partisan processes.

Other interfaces are *de facto* industry standards that arose without a formal standard-setting process but that are generally open for industry participants to use in deploying their own standards-compliant products.

And some interfaces are entirely proprietary, which is to say they are put into place unilaterally by one or another industry player, who claims ownership of that “standard” and asserts the right to prevent or control its use by others.

Obtaining control of key interfaces through anticompetitive means – or using control of key interfaces to extend a dominant position in one market into other markets – is a real danger in our industry. It is a major concern to companies like Broadcom who win through their ability to innovate. It should also be of concern to consumers and to their representatives at the antitrust agencies. That sort of behavior chokes off competition among industry players, which deprives consumers of the innovations and lower prices that come from vigorous competition.

At its most extreme, in our industry, interface control could enable a dominant firm in one critical piece of the motherboard to take control of the whole system, even if the quality and cost of its products do not support that result.

Those of us of a certain age know what an end-to-end monopolist in a communication space looks like – it was the old, totally-vertically-integrated telephone company. One company controlled all of the equipment, all of the connections, all of the interfaces – indeed, everything from the chips to the

telephone repairman. It wasn't simply that they had a lock on the industry. They, not competition, decided what innovations made their way to the consumer, and when. That slowed down the transfer of innovation – and as a consequence, telecommunications innovation in this country was outpaced by that in others.

In an increasingly competitive global economy, we cannot afford to return to those days. And the antitrust laws governing single firm conduct were the means by which that situation was remedied.

Today different technologies from different companies come together to create a plethora of consumer products, which we all enjoy and to a significant extent take for granted. This creates an ongoing challenge in defining how those technologies will interconnect and interoperate, and the rules that will apply to that endeavor. Even the best technology is of little use in isolation. The antitrust laws have an important role in policing the conduct of firms who would seek to take control of those interconnections so as to eliminate competition and thus harm consumers.

In my remaining remarks, I will focus on two areas of concern which, in Broadcom's experience, are particularly important to preserving competition. The first is standard setting. The second is the use of proprietary interfaces to extend a dominant position from one market to another. These are not theoretical issues. These are real issues that Broadcom has faced in the past and continues to face today.

We come at this from the perspective of a highly innovative company, with world class technology, attempting to break into new markets dominated by entrenched rivals. At the same time, we are an example of a company that has thrived through key contributions to important industry standards.

Standard Setting

Standard setting refers to the process of creating and implementing a common way of doing things. As a simple example known to all of us, there is the standard format for video called VHS. That standard makes it possible for a wide variety of competing manufacturers to make the various components that are needed to record and play home video – the camera, the tape, the VCR and so forth. Similar

standards exist for CDs and DVDs, as well as standards that allow voice, video, data and multimedia to be shared among various wired and wireless devices.

In addition to facilitating competition by enabling different companies to produce products that will interconnect and interoperate, standard-setting – when done properly – can also resolve intellectual property rights, or IPR, issues that might otherwise impede progress.

With the complexity of today's products, often multiple parties own IPR that is needed to implement a particular technology-based application. If Company A owns essential IPR and so do Companies B, C, D, and E, each can block the other, and everyone else, from making the product using the best available technical solutions.

In the standard-setting process, companies typically are required to agree that they will disclose their IP rights that are essential to practice the standard before the standard is adopted. This gives the standard-setting body and the participants in the standard-setting process the ability to avoid such IPR or to address the means by which that IPR will be licensed to those practicing the standard.

I'll get to licensing in a minute, but first a few words on IPR disclosure in standards-making.

There are those who say that disclosure is not a significant problem because companies generally play by the disclosure rules. They say that failure to disclose is rare and therefore not really a problem.

At Broadcom we aren't sure whether failure to disclose is, in fact, rare in all standards setting bodies. But even if that is the case, it can still be a serious problem. Indeed, the fact that participants in standard setting expect disclosure and rely upon it makes those instances of failure to disclose all the more problematic.

Without disclosure, the standard is at constant risk of being "hijacked" by an IPR holder that has "hidden in the weeds" during development of the standard, or – even worse – has helped steer development towards its own undisclosed proprietary technology, only to spring its trap after the standard has been set and millions or billions of dollars have been invested in its implementation.

This risk is not an abstract or theoretical concern. In fact, these hearings are particularly timely. Just this past Friday, a federal jury in San Diego rejected an attack on my own company by a firm attempting to force us out of certain technology spaces by asserting two patents that it controlled. Its infringement case was based in substantial part on our implementation of an industry standard for video compression. The jury found no infringement – and, perhaps even more significantly, also found that our adversary had violated the disclosure rules of the standard-setting body by failing to disclose its patents which allegedly covered the standard.

Sadly, the company that launched this ill-founded patent assault on an international standard cynically justified its actions afterwards on the grounds that it had “nothing to lose” in bringing the action, even though – after a nine day trial – the jury unanimously agreed that the company abused the standards process and also violated its duty of honesty and fair dealing with the U.S. Patent and Trademark Office. Meanwhile, defending itself against those illegitimate claims cost Broadcom millions of dollars – and the lawsuit created confusion and concern among our customers and the many others worldwide who use the H.264 video compression standard.

So this is a very real risk. If an opportunistic company can get away with these tactics, it would be in the position to dominate components for an important, ubiquitous video compression technology by asserting its patents against all would-be competitors.

But disclosure, important as it is, is not enough. Disclosure is only the first step in providing assurances that hijacking will not occur. Disclosure merely allows the standards development body to thwart or compensate for attempts to insert proprietary technology into the standard.

It is at least equally important for industry participants to abide by the rules after the standard is in place. A key element of that is licensing terms and conditions. The rules typically provide that IPR that is essential to practice a standard will not be included in the standard *unless* the owner agrees to license that IPR to those that wish to practice the standard on either royalty-free or fair, reasonable and non-discriminatory – so-called “FRAND” – terms.

What happens when someone fails to live up to these commitments?

As I noted, once a standard is set, the industry moves forward and invests millions if not billions of dollars in implementing the standard. That investment is based on the understanding and assumption that the IPR issues are resolved – either there will be no need to license the IPR or any licensing will be on FRAND terms.

If a company with essential IPR then seeks to impose *non*-FRAND license terms, the balance is completely upset. Suddenly the industry, which adopted the standard with the understanding that licensing costs would be reasonable, is confronted with a monopolist seeking to charge monopoly rates.

In industries that are involved in standard setting, there are certain practices that – I would venture to say – everyone understands are not FRAND terms.

For starters, *refusing to license at all* violates a FRAND commitment. Amazingly, there are some in the industry who take the position that – notwithstanding the commitment to license all who wish to practice the standard – essential IPR holders can pick and choose among potential licensees for any reason – including, it would seem, whether the potential licensee is a downstream competitor to the licensor.

Another example: Broadcom has been confronted by a licensor who participated in a standard setting process insisting that, as a condition to being granted a royalty-bearing license to the intellectual property essential to practice the standard, Broadcom would have to give back a *royalty-free* license to a much broader sweep of Broadcom intellectual property, including IP covering features and functions entirely unrelated to the standard. To usurp the blood, sweat, tears and genius of innovative companies in such a manner as a condition to practicing an industry standard runs directly contrary to the fundamental objectives of standard setting bodies. If this sort of practice is allowed, what incentive will any company have to innovate or invest, knowing that unrelated technology can be appropriated in this way as a price for making standardized products?

Another example that we have seen is a company attempting to use access to essential IPR to coerce customers into buying its products rather than letting the merits of the products determine who gets the sale.

And we have examples where a company has sought to “stack” a standard-setting organization with supposedly independent voters to skew the standard toward its own technology or away from its rivals’ technology.

To be clear, I do not suggest that a company should be required to share its technology with others – far from it. Patents are available to protect innovation, and Broadcom is a firm believer in our patent system.

But it is imperative that *when a company has made a commitment to license on FRAND terms* as a condition to getting its technology included in a standard, it must not be allowed to exploit the market position that it gained through incorporation of its IPR into the standard by renegeing on that commitment. And a company likewise should not be allowed to subvert the rules that are put into place to ensure that standard-setting is a non-partisan exercise.

These are very real and contemporaneous examples of the kind of anticompetitive single firm conduct that we believe the antitrust laws are intended to address.

Some say that determining what is "fair and reasonable" is too hard a task – that it is a standard that cannot be enforced. Often, the firms that say this are the very firms that have failed to disclose their patents, have engaged in rampant discrimination that cannot possibly be reconciled with a FRAND obligation, and have engaged in other behavior that demonstrates that it is a lack of will, not a lack of ability, that has resulted in their FRAND violations.

"Fair and reasonable" simply means that the technology will be available on competitive terms, rather than on terms that reflect the market power gained through inclusion in the standard. It also means that no participant will charge a disproportionately high royalty so as to hobble the standard or render it uncompetitive.

Technology companies are often engaged in patent litigation where a question before the court is how to assess a reasonable royalty in damages. There is no reason to believe that the courts would have a harder time figuring out what a reasonable royalty is in the standards context than in any other. The court would take due account of the competitive goals of the standard setting body in requiring a FRAND commitment and otherwise undertake the same exercise that it goes through in determining contract damages and in other contexts.

It has also been suggested that failure to comply with a FRAND obligation is a matter better left to contract than antitrust law. One might ask: if a court applying contract law can figure out what FRAND means, why can't the same court

applying antitrust law? Contract law is a private remedy to redress private rights. FRAND violations can eliminate competition and hurt consumers, competitors, innovation and the economy as a whole. Isn't preventing such injury exactly what the antitrust regime is all about?

Moreover, if companies are willing to break their FRAND commitment because they conclude they have little or nothing to lose in doing so, the contract remedy is inherently insufficient to protect innovation, competition and consumers, and that becomes the job of antitrust.

Interfaces

The second area I want to talk about is interfaces.

As I noted before, interfaces are the way one piece of technology connects to another.

By manipulating the interface and making it proprietary, a company with a monopoly over one area of technology can effectively shut out competitors in technology that would connect with its monopoly technology.

For example, if a company had a monopoly in amplifiers, it could obtain a monopoly in speakers by creating a proprietary amplifier-to-speaker interface and refusing to license that interface to anyone. The speaker market, which previously enjoyed vigorous competition that fostered innovation and lower prices, would suddenly be controlled by one firm with little incentive to innovate or reduce prices.

We've seen this in practice. Broadcom is a communications chip company. Our chips connect devices and systems. We have seen, for example, companies that control the main processor of a particular system, one that at one time was characterized by an open interface, suddenly make that interface proprietary. For no good technological reason, they make it harder to interconnect with that chip, while at the same time launching their own communications chip. This two-pronged strategy – control the connection with the dominant product and compete in the adjoining market – has the predictable result: the dominant firm leverages its monopoly from one area outward into ever greater areas. Over time, the dominant firm expands its empire to the entire motherboard, destroying its competitors and the innovation they would bring along the way.

There certainly are instances where the development of new interfaces is real innovation. Where there is real innovation *in the interface*, innovators should have the opportunity to be appropriately compensated. But that compensation should at best take the form of a modest, truly non-discriminatory royalty. It should not be a vehicle for extending dominance from one kind of chip to another by, for example, the kind of asymmetrical grantback of IPR from the licensee to the licensor that I discussed earlier. And a small improvement in interface technology should not come at the sacrifice of innovations of orders of magnitude more significance in the adjacent communications markets, if innovators' chips can no longer communicate with the now-closed interface.

Of course, sometimes the new interface does not even represent an improvement, just a difference. When a company has a history of using open interfaces or of licensing its interfaces to third parties and then stops doing so, while at the same time entering the market on the other side of the interface, one ought to be suspicious of its intent. We've experienced that in our industry. Again, there is a role for antitrust when such changes provide little or no benefit but substantially hurt innovation and therefore consumers and the economy as a whole.

Conclusion

I recognize that I have barely scratched the surface of these issues. Much depends on the individual facts and circumstances of a particular case and market. That said, the antitrust laws and the courts and agencies that are called on to enforce them should not shy away. Usually, once the facts are separated from the noise, it is not difficult to distinguish the procompetitive stories from the anticompetitive ones. Particularly in the area of deceptive conduct in standards setting processes, there is little risk that procompetitive behavior will be deterred.

In closing, I hope the FTC and the DOJ and those who are thinking seriously about antitrust in the twenty-first century will take away from my remarks today three basic concepts:

First, antitrust as it relates to single-firm conduct remains important to ensuring competition in our high-technology markets.

Second, we have seen in recent years the creation and abuse of monopoly positions through conduct that serves no useful purpose and therefore should be counteracted by the antitrust laws.

Third, the antitrust laws must remain flexible and responsive to these ever-changing conditions. Blind reliance on outmoded principles and, even more importantly, a refusal to consider the particular facts of a particular case is a terrible mistake that courts and the agencies should not make.

I thank the FTC and the DOJ for the opportunity to speak today and for your thoughtful consideration of these important issues.