

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of:)	
)	
Implementation of Section 304 of the Telecommunications Act of 1996)	CS Docket No. 97-80
)	
Commercial Availability of Navigation Devices)	
)	
Compatibility Between Cable Systems and Consumer Electronics Equipment)	PP Docket No. 00-67
)	
)	

**COMMENTS OF
ATI TECHNOLOGIES, INC., DELL COMPUTER CORPORATION,
HEWLETT-PACKARD COMPANY, INTEL CORPORATION,
MICROSOFT CORPORATION AND NEC CORPORATION**

March 28, 2003

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SUMMARY

The Joint Commenters favor adoption of the cable and consumer electronics industries' Memorandum of Understanding regarding plug and play cable compatibility (the "MOU"), with the clarifications enumerated in these Comments. The MOU represents an important first step forward into the age of digital content delivery over cable, an essential entertainment conduit for American consumers. It is important, however, the Commission and the effected industries get this first step right, or the market distortions that could result may be extreme.

The Joint Commenters' reservations about the MOU and the associated proposed rules and DFAST License regime revolve around the potential anti-competitive impact that could result from an unduly restrictive reading of these documents' provisions. The Joint Commenters believe firmly all technologies that can deliver digital cable content to consumers should operate on a level playing field so consumers – not the Commission or the cable and consumer electronics industries – determine what method of receiving digital cable content is best for them. The Joint Commenters believe that one of the most versatile and consumer-friendly technologies will be the cable-modem-enabled personal computer. If taken literally, however, several provisions of the MOU and its associated documents would appear to exclude the IT industry and its products entirely, providing less versatile technologies an unfair head start in the race to consumer acceptance and adoption. Obviously, this head start could result in permanent market dominance for these privileged technologies and stifle innovation and competition. The Joint Commenters believe any agreement that receives the Commission's blessing must, at a minimum, ensure that each technology have an opportunity to compete fairly. Accordingly, the Joint Commenters urge the Commission to clarify the provisions of the MOU and its associated

documents that appear to exclude cable-modem-enabled personal computers and other potential information technology industry products.

In particular, the Commission must clarify that an acceptable DFAST License regime must include access to all technologies that can offer acceptable levels of content protection. The Joint Commenters recognize the need for speedy approval of the DFAST License to allow digital cable products to get to consumers as quickly as possible. Nonetheless, the Commission cannot approve of this licensing scheme if it will permit participation only by certain producers of consumer digital cable products. It is important the Commission clarify that to be acceptable, the DFAST License must be understood to permit participation by producers of cable-modem-enabled personal computers and other information technology industry digital cable products.

Moreover, the Commission must clarify appropriate means of administering the DFAST licensing scheme, including the rules governing the application of encoding, robustness, and compliance rules. Clear rules and standards in these areas are absolutely necessary to innovation and competition. Technology designers and producers must know precisely what content protection capabilities will be expected of new technologies if they are going to invest in development. They must know what it will take to obtain and retain a DFAST License. Equally important, they must know what possession of a DFAST License means. Accordingly, the Commission should construe as narrowly as possible all provisions of the MOU and its associated documents that give CableLabs or cable operators authority to change or vary content encoding rules without the participation of all interested parties in a public proceeding.

The Commission also should avoid any interpretation of the MOU's provisions that would require a level of content protection that is beyond current technology or that is unreasonably demanding. Required levels of content protection should be that necessary to

defeat the efforts of the average user, using average equipment. Technologies should not be required to be capable of defeating the committed content pirate simply to be able to exist in the marketplace. The FCC also should avoid any backdoor endorsement of any particular watermarking technology. Current watermarking technology is imperfect, and it may never work sufficiently well to justify requirement through government regulation.

With these clarifications, as well as those elaborated in greater detail herein, the Commission should approve the MOU and its associated documents with all deliberate speed.

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MICROSOFT CORPORATION, AND NEC CORPORATION**

ATI Technologies, Inc., Dell Computer Corporation, Hewlett-Packard Company, Intel Corporation, Microsoft Corporation, and NEC Corporation (the “Joint Commenters”) hereby submit these comments in response to the Commission’s *Further Notice of Proposed Rulemaking* in the above-captioned proceeding and the Memorandum of Understanding Among Cable MSOs and Consumer Electronics Manufacturers, which was filed December 19, 2002.¹ The Joint Commenters are computer software and hardware designers and manufacturers that have worked with both the content production and consumer electronics industries over the past several years to resolve digital content protection issues and speed the introduction of innovative

¹ *Implementation of Section 304 of the Telecommunications Act of 1996; Commercial Availability of Navigation Devices; Compatibility Between Cable Systems and Consumer Electronics Equipment*, Notice of Proposed Rulemaking, FCC 03-3 (rel. Jan. 10, 2003); *see also* Letter from Carl E. Vogel, President and CEO, Charter Communications, *et al.*, to Michael K. Powell, Chairman, FCC (Dec. 19, 2002) (the “MOU”).

new digital information and entertainment technologies to consumers. For example, many of the Joint Commenters participated in the development and negotiation of the highly successful Digital Versatile Disk content protection system (the “DVD CSS”). The Joint Commenters take a particular interest in the content protection issues concerning cable television and digital content because cable compatibility is an important part of the future of personal computers as full-service conduits for bringing information and entertainment to American consumers. If the marketplace is left to function in a free and fair manner, cable-modem-enabled personal computers and other cable compatible home computing products will be at the forefront of delivering digital video and information content to American homes. Accordingly, the Joint Commenters have a manifest interest in making certain that a plug-and-play cable compatibility regime is instituted. The Joint Commenters endorse this first step towards making this future a reality, with the technical reservations described herein.

I. INTRODUCTION

As an initial matter, the Joint Commenters applaud the cable and consumer electronics industry on their efforts in developing the MOU, the associated regulatory package, and the DFAST technology license. These submissions demonstrate that a critical first step has been taken that promises to speed the broadband future to the American consumer. Substantively, the Joint Commenters endorse the basic framework adopted by the MOU, which, if properly administered, will allow digital services to expand through the development of competitive markets for the technology necessary to make new and innovative services available.

Nonetheless, the Commission must recognize that the bright digital future will not arrive unless digital content delivery and protection systems take proper account of both the limitations inherent in today’s content protection technologies and consumers’ legitimate expectations. Some requirements of the MOU, if left unaltered and interpreted strictly, could severely reduce

the number and diversity of products that will qualify for the DFAST License. Likewise, strict application of other provisions of the MOU will reduce the ability of equipment designers and manufacturers to give consumers the functionality they expect from their electronic entertainment and information products.

To prevent these outcomes, the Joint Commenters urge the FCC to clarify the draft regulations and provisions of the DFAST License in the areas described below, so that the eligibility and compliance standards applied to new and existing technologies will be objective and well-defined. Clear standards are necessary to encourage innovation and competition. Clear standards also are necessary to ensure that new technologies are given a fair chance to succeed in a marketplace free of arbitrary constraint. The Commission must insist that the elements of the DFAST License described below be administered by CableLabs in an open and non-discriminatory fashion so that the FCC's endorsement of the DFAST License regime does not become a pretext for allowing CableLabs to pick the winners and losers in tomorrow's contest to produce cable video and information technologies that will best serve consumers' needs.²

II. THE LICENSING SCHEME PROPOSED BY THE MOU SHOULD BE REFINED TO APPLY TO A WIDER RANGE OF CABLE PRODUCTS, TO FURTHER LIMIT IMAGE CONSTRAINT, AND TO FLESH OUT THE STANDARDS THAT WILL APPLY TO ENCODING RULE CHANGES.

A. The Commission Should Confirm That Technologies Cannot Be Excluded From the DFAST Licensing Program Solely Because They Offer Internet Connectivity.

As a threshold matter, the Commission should require clarification of the technology and devices to which the MOU and the DFAST License apply. The MOU applies only to

² Once clarified as suggested herein, the Joint Commenters believe the Commission should approve the DFAST License so that it can be used as soon as possible, even, if necessary, before adoption of global encoding rules.

unidirectional cable products, and only those products will be eligible for the DFAST License following CableLabs' approval. The definition of "Unidirectional Cable Products" in the DFAST License, however, excludes all "interactive . . . digital television products, including, without limitation, products that are capable of obtaining access to video-on-demand or . . . of using the return path of the cable system . . ." ³ This definition could exclude otherwise eligible products, such as cable-modem-enabled personal computers, from obtaining a DFAST License because such products are "capable" of accessing the Internet through the cable modem and otherwise.

Making the DFAST License widely available to a range of competing technologies is essential to maintaining a level competitive playing field. It is no answer that future negotiations will cover "bidirectional" cable products, if that term is defined to include all products capable of offering Internet connectivity. This distinction would give producers of less versatile technologies an unfair head start over technologies such as personal computers in providing digital cable services to consumers. Instead, the Commission should ensure that all technologies begin and continue to compete on a level playing field by expressing its view that Internet connectivity and cable modem compatibility are insufficient, standing alone, to remove products or technologies from eligibility for the DFAST License. Unidirectional Cable Products that use an Internet Protocol network transmission path also should not be excluded from license eligibility.

Indeed, the Commission should note that several provisions of the MOU appear to make computer industry participation in the DFAST licensing scheme unnecessarily difficult. In this

³ See Draft DFAST Technology License Agreement for Unidirectional Cable Products, § 1.19 (the "Draft DFAST License").

regard, the Joint Commenters note that despite repeated requests, no IT company was permitted to participate in the discussions creating the proposed rules and MOU. The Joint Commenters hope that the potentially discriminatory provisions about which it has concerns were included because of oversight rather than any effort to restrict competition and innovation. For example, the Proposed Compatibility Regulations' requirement of certification and subsequent self-certification of every Digital Cable Product threatens to make participation unworkable due to the interchangeable-component nature of personal computer manufacturing.⁴ A strict reading of the certification requirements would force a PC manufacturer to provide certification materials for a potentially infinite number of combinations of hardware and software. The Commission should clarify that it understands these certification requirements apply only to the parts of a computer that actually handle protected content and not, as the proposed rule would suggest, to all the possible configurations or larger aggregations of these content handling components and other computer parts.

Two other requirements appear to tilt the competitive playing field against personal computer technology. First, the proposed rules appear to require that the display buffer transported along with the program content not be stored in any way.⁵ Strictly interpreted, this could exclude all PC graphics subsystems from eligibility for DFAST licensure because those subsystems function by temporarily storing the displayed information, including the display buffer. Similarly, the requirement that data moved to recording devices be transported only over

⁴ See Recommended Regulations to Ensure Compatibility Between Digital Cable Systems and Unidirectional Digital Cable Products and to Provide for Appropriate Labeling of Such Products at 4-6 (§ ___ (d) (Unidirectional Cable Products)); Memorandum of Understanding Among Cable MSOs and Consumer Electronics Manufacturers, § 3.7 (the "MOU").

⁵ See Draft DFAST License, Exhibit B, § 3.2.

approved encrypted links could be applied to the internal buses connecting optical recording drives to the PC's main operating systems.⁶ If CableLabs adopts this interpretation, PC manufacturers will be forced to significantly alter their system architecture, increasing cost and complexity without significantly improving content protection. The Commission should instruct CableLabs to avoid interpreting the DFAST rules in a manner that significantly disadvantages one technology over another.

B. The Commission Must Eliminate All Image Constraint Requirements for Products Delivering Programming Over Cable Platforms.

1. *The Commission's Rules Should Explicitly Ban Image Constraint for Defined Business Models.*

Clear rules regarding image constraint are essential to promoting competition and innovation in digital video delivery technologies.⁷ If new technologies and services are to be viable, businesses must know in advance what standards they will need to satisfy to ensure that full digital delivery will be available over cable television platforms. The Joint Commenters supports the MOU's elimination of selectable output controls and downresolution of over the air broadcasting signals.⁸ The practice of imposing image constraint weakens the appeal of digital cable products to consumers. In effect, image constraint reduces incentives for consumers to invest in the expensive technologies necessary to access digital content because it essentially takes away the benefits in terms of picture quality that digital technology promises to provide.

⁶ *See id.*, § 3.3.

⁷ Image constraint typically involves remote signaling of consumer reception devices by content providers or distributors, to partially disable such reception devices for particular programs. The effect of image constraint is to deprive viewers of digital and high-definition content due to their use of technologies with content protection systems that the content provider deems ineffective. *Also cf.* MOU § 2.2.

⁸ Proposed Encoding Rule § 76.1903(1). *See also*, MOU § 2.2.

Accordingly, the Joint Commenters oppose all forms of image constraint for programming provided through Defined Business Models, and urges the FCC to eliminate it completely.

2. *The Commission Should Clarify the Manner in Which Image Constraint Techniques Can Be Applied to Undefined Business Models.*

The proposed rules would allow cable operators to impose image constraint on Undefined Business Models with notification required only through the PR Newswire.⁹ To ensure that adequate notice is given, the FCC should require that cable operators document their intentions to impose on Undefined Business Models encoding rules more restrictive than those applied to Defined Business Models in a filing with the FCC. The proposed rules also appear to restrict standing to object to unduly restrictive encoding rules for Undefined Business Models.¹⁰ The Commission should clarify that any party that can satisfy the standing requirements generally imposed by the Commission on parties filing petitions or challenges against Title III applications will have standing to protest the imposition of new encoding rules on an Undefined Business Model.

C. The Commission Should Alter the MOU's Proposed Rules for Applying Different Encoding Rules to Defined Business Models.

The process created by the MOU for applying different encoding rules to Defined Business Models appears to be flawed in at least two key respects. First, the Commission should not allow individual petitions from cable operators to apply different encoding rules to Defined Business Models.¹¹ The format currently proposed in the MOU invites abuse by allowing a cable operator to change the terms of the DFAST License for all licensees in mid-stream, based

⁹ *See id.* § 76.1903(3)(a)(1).

¹⁰ *See id.*, § 76.1903(3)(a)(2)(b).

¹¹ *See id.*, § 76.1903(2)(c).

on a single, individual petition. The appropriate procedure for amending the encoding rules should be through standard notice and comment rulemaking, in which all interested parties have an opportunity to participate. This process is preferable to that suggested by the draft regulations in which important encoding issues would be decided through the adjudication of individual petitions.

Second, even if the Commission adopts the procedure described in the MOU and associated regulations, it must clarify the “public interest” test cable operators will be required to satisfy to justify application of different encoding rules to Defined Business Models.¹² The proposed procedure will work effectively only if the FCC fleshes out the elements of the “public interest” test cable operators must satisfy to justify differential treatment. These protections are essential to encourage innovation in the development of different technology platforms. New technology producers must be confident that, once a new technology is approved, its ability to function as approved will not be compromised arbitrarily by cable operators’ piecemeal dismantling of the encoding rules.¹³

D. The Commission Should Alter or Eliminate the “Bona Fide Trial” Exception to the Encoding Rules.

The FCC also should either alter or reject the “bona fide trial” exception to the encoding rules.¹⁴ “Bona fide trial” is not defined in the draft rules, and there is no apparent way to distinguish between a “bona fide trial” service and any other service. A “bona fide trial” should

¹² *See id.*, § 76.1903(2)(c).

¹³ The draft rules also provide a “public interest” test to evaluate appropriate encoding rules for Undefined Business Models. *See* Proposed Rule § 76.1903(2). The rule specifies certain factors for the FCC to consider, *see id.* at § 76.1903(2)(c)(iii)(a)(1-3), but if it adopts these standards, the FCC should give clear guidance as to the content of the public interest standard, and provide objective criteria.

¹⁴ *See* Proposed Encoding Rule § 76.1903(4).

be specifically time-limited, *i.e.*, no more than six months, and it should be permitted for Undefined Business Models only. The Commission must ensure that any exemption for a trial service does not provide cable operators with the opportunity to employ variable encoding rules to new services indefinitely. As currently drafted, the exception threatens to swallow the rule.

III. THE FCC MUST MAKE THE STANDARDS FOR INTRODUCTION AND MAINTENANCE OF NEW DELIVERY AND CONTENT PROTECTION TECHNOLOGIES AS TRANSPARENT AS POSSIBLE TO ENCOURAGE INNOVATION AND COMPETITION.

A. Approval of New Content Protection Technologies Must Be Evaluated Under Objective Criteria Openly Available to Technology Developers.

The Joint Commenters endorse the basic framework for industry consideration of adding new content protection technologies using objective criteria. The MOU's proposed test for whether new content protection technologies adequately protect content provides a fair context for testing new technologies.¹⁵ The draft rules do, however, state that one criteria by which new protection technologies will be judged is an undefined "other objective criteria" category.¹⁶ The FCC must require CableLabs to approve output technologies based on objective criteria regarding content protection, not on the basis of specific equipment or technological connectivity requirements. Accordingly, the Commission should spell out for CableLabs precisely what these objective criteria should be. In describing the objective criteria, the FCC should be careful to ensure that the criteria CableLabs must use are sufficiently specific to ensure equal treatment of competing technologies; and to make certain that potential solution vendors know by what criteria their technological innovations will be judged. Moreover, the Commission should add to the rules a mechanism for periodic Commission reviews and updates of the objective criteria to

¹⁵ See Draft DFAST License, Exhibit B, § 2.4.4.

¹⁶ See *id.*

ensure that they remain consistent with the existing state of the art. The Commission also should clarify that potential vendors, not just DFAST licensees, should be able to apply to CableLabs for consideration and approval of content protection technologies.

B. The Commission Should Recognize the Limitations of Current Watermarking Technology and Prohibit CableLabs From Introducing *De Facto* Watermarking Requirements Through Administration of the DFAST License.

The FCC also must address the watermarking provisions of the DFAST License.¹⁷ As an initial matter, the DFAST License is an inappropriate vehicle for obtaining what would amount to FCC approval and endorsement of watermarking. As the Commission knows, substantial questions remain regarding the effectiveness of watermarking, and a watermarking requirement should be the subject of a great deal more deliberation before the FCC approves such a scheme. Nonetheless, if the FCC were to approve such a provision, it must clarify the term “consensus” and confront the limitations of watermarking.

At this point, watermarking is not an effective content protection device, and it may never be. The Copy Protection Technical Working Group, in which the Joint Commenters participate, has formed an Analog Reconversion Discussion Group to provide a technical review of a variety of methods, including watermarking, to preserve at least some of the rights attached to protected digital content through the digital-to-analog-to-digital transformation.¹⁸ Nonetheless, much work remains to be completed in this area, and the future success of watermarking remains in doubt.

¹⁷ See Draft DFAST License, Exhibit B, § 2.5.

¹⁸ The Analog Reconversion Discussion Group (“ARDG”) was formed to examine technologies and systems with a view to identifying technological tools that may be relevant to addressing security issues arising from the conversion of protected, copyrighted commercial audiovisual content from digital to analog format and reconversion to digital format. The group meets monthly in Los Angeles and Washington, D.C., consists of a variety of industry participants

Moreover, as a practical matter, for a consensus analog reversion technology to be effective, it may well require government regulation. Thus, the FCC should reject any such partial rule until it is appropriate, if ever, to consider an analog reversion methodology as a whole. A stop-gap watermarking requirement will only hinder development of a comprehensive solution. By including watermarking in the DFAST License, the MOU essentially asks the FCC to approve an unseen watermarking technology and to concede future regulation of that technology to CableLabs.

If the Commission is going to approve the DFAST License – and include “analog consensus” language – it must provide technology developers and vendors with some safeguards against misuse of the DFAST License’s “consensus” requirements. For example, although the compliance rules explain that such a Consensus Watermark will be “developed on a multi-industry basis pursuant to a broad consensus in an open, fair, voluntary process” and will “thereafter be[] identified in a notice by CableLabs . . .,” this provides little insight into what the actual process will be. If the FCC approves any “Consensus Analog Reversion” methodology (*i.e.*, not limiting a methodology to watermarking), it should prescribe minimum standards of openness and industry participation that will be sufficient to constitute a reasonable consensus solution.

The FCC also must require CableLabs to clarify the meaning of “commercially reasonable care” as it is used in the draft compliance rules.¹⁹ Taken literally, the compliance rules appear to require DFAST licensees to do the impossible by avoiding any technological

interested in the technical aspects of content protection design, and maintains a discussion page regarding technical content protection issues at <http://www.cptwg.org/Assets/Presentations/ARDG/ARDG%20page.htm> (last visited, March 28, 2003).

¹⁹ See, e.g., Draft DFAST License, Exhibit B, § 2.5.1(a).

features that will interfere with the Consensus Watermark or other consensus methodology. As both the cable industry and Consumer Electronics Association know, many legitimate video content technologies – such as zooming, scaling and compression – interfere with current watermarking technology. The best result that can be expected is that devices not be designed to interfere intentionally with or circumvent watermarks. Consequently, the compliance rules contained in the DFAST License are fundamentally contradictory when they permit licensees to incorporate “legitimate” programming features, yet, require them to take “commercially reasonable care” not to interfere with watermarks.²⁰

Nonetheless, if Consensus Watermark requirements are to be included, the FCC should direct CableLabs to elaborate on this compliance rule and clarify what is required for compliance with this inherently contradictory requirement. As a starting point, the Commission should indicate its understanding that until watermarking technology significantly improves, this portion of the DFAST License may be used to do no more than to prohibit the manufacture of technologies designed and built with the primary purpose of interfering with analog reversion technology.

C. The Robustness Requirements of the DFAST License Must Be Clarified To Ensure That Licensees Are Not Subjected to Unreasonable Expectations Regarding Their Ability To Protect Content or To Change Immediately in Response to New Circumstances.

The robustness rules also require all products that are shipped be made to “effectively frustrate attempts to discover or reveal” keys and cryptographic secrets. This potentially absolute standard simply invites abuse. Again, the FCC should make clear its understanding that unbreakable video cryptographic techniques have not yet been developed and direct that

²⁰ See Draft DFAST License Agreement, Exhibit B, § 2.5.2(3).

CableLabs administer its DFAST License rules accordingly. It would be unreasonable to expect all video technologies to effectively frustrate attempts to break cryptographic codes all of the time. This problem has been discussed in the broadcast flag proceeding and is equally relevant here.²¹

Rather than an absolute “effectively frustrate” standard, the FCC should advise that the robustness rules should specify the tools against which particular technologies must be resistant, the skill level of the attacker, and the level of effort needed to overcome any encryption scheme. Keeping in mind that not only sophisticated users but also sophisticated technologies continue to exist that, if used improperly, can frustrate content protection despite the best efforts of technology developers and vendors. This standard should be designed so that devices and technologies are required to provide protection only against consumers of average technical capabilities.

In addition, the DFAST License’s “new circumstances” provision is too narrow and should be expanded.²² The new circumstances provision would require licensees to cease distributing their Unidirectional Cable Product within eighteen months if circumstances arise that would make the product incapable of meeting the robustness rules. The possibility that products will be required to cease distribution through no fault of the designer/manufacturer will likely stifle competition and innovation in Unidirectional Cable Products. Additionally, this will effectively prevent incorporation of any critical components into cable products’ operating system software, potentially increasing design, development, and eventual production costs.

²¹ See, e.g., Comments of the IT Coalition, MB Docket No. 02-230, filed December 6, 2002 at 26-29.

²² See Draft DFAST Technology License Agreement for Unidirectional Cable Products, Exhibit C, § 3(f).

A better model for handling new circumstances would be that contained in the DVD CSS Specifications, which, among other refinements, treats operating system products and non-operating system products differently and provides mechanisms for product vendors to request additional time to solve non-compliance issues.²³ The Commission should endorse only a “new circumstances” provision that increases protection for Unidirectional Cable Product vendors and developers that more closely resembles the DVD CSS standards.

IV. CONCLUSION

The MOU represents a significant step toward delivering the next generation of digital services and technology to consumers, and the associated DFAST License can, if properly administered, create an environment that is fair to technology vendors, good for consumers, and safe for content providers. The Commission must be careful, however, not to allow any parties to the MOU to use its provisions – and FCC approval of them – to engage in anticompetitive conduct that excludes personal computers from the cable product marketplace. As described, that outcome will be detrimental to innovation, and, consequently, bad for consumers. Instead, the Commission must seize this opportunity to clarify certain obscure areas of the MOU in order

²³ DVD CSS Specifications, Version 1.1, §§ 6.2.4.3, 6.2.5.5, 6.2.6.4.

to ensure a level competitive playing field and maximum consumer choice for digital cable products.

Respectfully submitted,

By /s/ Richard A. Beutel
Richard A. Beutel
Director, Policy and Legal Affairs
Dell Computer Corporation

/s/ Jeffrey Lawrence
Jeffrey Lawrence
Senior Attorney
Intel Corporation

/s/ Andy Moss
Andy Moss
Director Technical Policy
Microsoft Corporation

/s/ Motoyuki Sato
Motoyuki Sato
Director, Technology Assessment, C&C
Research Lab
NEC Corporation

/s/ Richard H. Grote
Richard H. Grote
Vice President, Research & Development
Consumer PC Global Business Unit
Hewlett-Packard Company

/s/ David Kleiman
David Kleiman
ATI Technologies, Inc.

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