October 8, 2002

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C.

Re: In the Matter of Compatibility between Cable Systems and Consumer Electronics Equipment, Docket No. PP00-67, and
In the Matter of Commercial Availability of Navigation Devices, Docket No. CS 97-80.

Written Ex Parte Presentation

Dear Ms. Dortch:

Intel Corporation respectfully submits this written **ex parte** letter in the above referenced proceedings. Intel is keenly interested in the development and promotion of a competitive market for Navigation Devices as contemplated by Section 629 of the Communications Act. We appreciate the opportunity to contribute to the ongoing dialogue through these comments which (1) touch on general principles with respect to the development of a standards-based competitive market, and (2) apply those principles to the current Pod-Host Interface Specification ("Specification") and Pod-Host Interface License Agreement ("PHILA") currently being developed and offered by CableLabs under FCC oversight. In this context, we have reviewed the recent submission by the Consumer Electronics Association ("CEA") and the draft PHILA submitted by CEA ("CEA Draft"). As both a member of CEA, and a leading information technology company, we support the approach suggested by the CEA in the CEA Draft. While we generally agree with much of the legal analysis offered by CEA in its submission, our comments are offered from the perspective of doing an implementation in a multi-function computing device, like a personal computer.

Introduction

Intel Corporation is the world's largest semi-conductor manufacturing company. It is a leader in the development and deployment of digital communications and computing technologies. Intel has a direct interest in seeing a competitive, standards-based marketplace for cable compatible navigation devices based on the "right to attach" proscribed by Congress. Intel is interested not only because it wants the opportunity to provide navigation devices, but because of the broader opportunities to provide a wide array of interoperable computing devices and the building blocks for those devices. Intel

is uniquely positioned to contribute to this discussion as an information technology company. We therefore offer these comments from that perspective.

Congress' Vision.
Congress codified its vision of a competitive retail market for Navigation Devices in Section 629 of the Communications Act (entitled "Competitive Availability of Navigation Devices"). That vision contemplates rich consumer choice and product innovation in robust markets. Congress enabled that vision by giving all product and technology providers the right to attach their devices to cable television networks, only limiting that right to prevent harm to the network or theft of service. In light of the right to attach, the only technical obstacles standing in the way of this vision are the absence of standard interfaces that remove barriers to market entry and enable interoperability and product innovation. With standard interfaces in place, Congress believed the market would respond with products providing rich innovation and choice to the direct and immediate benefit of consumers and content providers alike. Intel shares Congress' vision.

Intel Shares Congress' Vision: The Digital Home Initiative.
As digital communications and computing technologies advance, digital devices are both evolving and converging as the natural market demand for integration and interoperability marches forward. Intel shares' Congress' vision of a world where intelligent platforms and devices seamlessly interoperate in the home-networked environment, enabling consumers to enjoy any content, any place, in any device, any time, in new rich and compelling ways.[1] (Such products include not only computers, "smart" set top boxes, televisions, media players and recorders, game consoles, wireless tablets and peripherals, but devices we cannot even contemplate today.) To that end, Intel actively participates in cross-industry efforts to establish cooperative networked platforms providing vastly enhanced media value within the home. In addition, Intel has worked for the past six years with content providers to create and deploy digital content protection technologies. Those technologies are based on strict principles of interoperability and consistency with this vision.[2] Intel's vision is to enable any and all classes of digital devices to compete on a level playing field; enabling consumers to choose the products that best fit their particular needs.

Competitive Standards Based Markets: Some Principles for Success.
Over the years, Intel has participated in, and indeed driven, many efforts to grow competitive market-segments through interoperability specifications and industry standards, including, for example, USB, PCI, 802.11, and many others. We have learned a great deal through these efforts and appreciate the opportunity to share some of that knowledge with the Commission.

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[1] It goes without saying that this should be done in authorized manners.
[2] Such technologies include some the Commission may be familiar with, such as Digital Transmission Content Protection ("DTCP") offered by the 5C Entity LLC, Content Protection for Removable Media ("CPRM") and Content Protection for Pre-recorded Media (DVD Audio or "CPPM") offered by the 4C Entity LLC, and High-bandwidth Digital Content Protection ("HDCP") offered by Digital Content Protection LLC.

Creating a robust and competitive environment based on industry standards and specifications in large measure depends on removing barriers to market entry for new product offerings. There are many "best methods" for achieving this goal. The following are just a few culled from our years of experience in promoting efforts designed to remove barriers and foster a proliferation of market devices and participants. We have applied these general principles both in strict technology/interoperability efforts such as USB, and in efforts where principles of content protection (policy and technology) are also employed such as DTCP.

First, successful standards and specifications must limit required features ("normative references") to a very narrowly defined but robust interface specification. This will enable and promote interoperability, innovation and integration. Anything else not specifically required to achieve this technical objective and ensure interoperability must be included in the specification as an optional feature (an "informative reference"). While normative references should be minimal, a robust specification should contain those optional features that enable implementers to produce innovative products. This is particularly true in the cable environment where an understanding of an underlying cable technology may be imperative to innovation. The license and the specification, however, should clearly distinguish between normative and informative references

Second, implementers must have design freedom to enable them to implement the technology in ways that encourage not only diversity of product offering and application, but also enable differentiation from competing products in the market place. This underscores the importance of the point above.

Third, the specifications must be robust enough to permit innovation over time and enable features that the ultimate products' consumers will demand.

Fourth, and perhaps most important, implementers should be free to self certify their products' interoperability and compliance with the specification. Voluntary means for assisting implementers (such as test suites, software, plug fests, etc.) are useful, but self-certification is key as it eliminates bottlenecks and creates an even playing field for market entry.

Improving PHILA and the Specifications.

Applying the principles set out above to both the PHILA and the Specifications reveals several areas of concern, particularly for makers of multi-function devices that have multiple configurations, like computers. Most of these issues are addressed by the draft license recently submitted to the FCC by the Consumer Electronics Association ("CEA Draft"). In the interest of brevity, in the following examination we have highlighted some of the larger issues but have not provided an exhaustive analysis. We would be pleased to discuss in greater detail any or all of these issues with the Commission at its convenience.

1. *The current PHILA/Specifications do not to accomplish Congress' goals.* From a technical and implementation perspective the PHILA/Specifications are simply too broad, and are not limited to a narrowly defined interface or even to necessary security technology. Rather, the PHILA/Specifications contain a whole host of features and functions that are unrelated to interoperability and security[3], and an extremely large number of related normative specifications are included by reference.[4] Despite the requirement that implementers must enable this broad range of features unrelated to the interface, there is no assurance or requirement of any kind that content providers and cable operators will ever even avail themselves of those features and functions. Intel recommends specifically limiting the Specifications to normative interface specifications approved by ANSI[5], and adopting the approach advocated by CEA in the CEA Draft.

2. *No real design freedom*. In light of the problems already identified in Paragraph 1 above, in reality, the PHILA/Specifications define a traditional set top box and undermine real design freedom, the ability to innovate, and the ability to integrate, navigation features and functionality into multi-function devices. The PHILA/ Specifications define a limited consumer device (both with respect to form and function) with specific features. The Specifications require strict compliance as to product design and operation unrelated to security. Moreover, the Specifications define functionality and mechanical integrity of products "as a whole" and not just with respect those portions of a device that in fact implement the Pod-Host Interface, or even those portions of a device that represent the "Host" instantiation. In addition, CableLabs retains discretionary power both to further define these features, and to replace the Specification with an entirely new or material different specification. It is even more troubling that the PHILA contains no requirement that any materially changed or new specification be backwards compatible with previous versions of the Specifications. This potentially makes entire generations of products and their associated capital investments worthless. The Compliance and Robustness Rules complicate these facts by opening the door for CableLabs to dictate the features and behavior of other technologies that might be approved outputs without regard for security concerns. Collectively, these issues not only eliminate design freedom, but create

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[3] Just by way of example, section 7.2.2 of the OpenCable Host Device Core Functional Requirements specifies requirements for the resolution, aspect ratio, frame rate, and scan sequence of a terminal host device's display. Another example, found in section 10, requires the navigation device to maintain network connectivity, consume power, and run the processor, operating system, and navigator shell, even though it is powered "off". In section 12, requirements include mechanical and environmental properties such as: Input Line Voltage, Input Line Frequency, Nominal Power Consumption, Physical Security/Tampering-Resistance, RF Susceptibility, Radiated RF, Conducted Lightning Surge Tolerance, Line Surge Test, Line Surge Test , Power Cross, Electrostatic Discharge, Brown Out Effects, Operating Ambient Temperature and Humidity, External Surface Temperature, Storage Temperature, Storage Humidity, Altitude, Thermal Shock, Humidity Shock, Solvent Resistance, Shipping Vibration, Mounting Feet, Keypad Keys, Impact Test, Static Load on Keypad Keys, Handling Drop Test, Strain Relief Test, Non-volatile Memory Battery Life, Microphonic Shock, etc. These types of requirements do nothing to promote interoperability, prevent theft of service, protect copyrights, or secure the cable network. Their only effect is to restrict innovation and product differentiation, add unnecessary and burdensome product cost, and limit consumer choice.

[4] The Specifications contain 130 separate normative references to other specifications and publications. See Exhibit A for a listing.

[5] Some of the security enhancements to those ANSI specifications, such as mutual authentication between host and pod, may be appropriate to carry over.

material barriers to market entry. Intel recommends eliminating all "requirements" unrelated to the interface and network security and allowing the market to drive product features and other functionality. In this context, Intel supports the approach adopted by the CEA in its draft.

3. Anti-Consumer Features. The PHILA fails to support, and in fact prohibits, consumer features such as moving PVR recordings to another device in the home network. Features like "move" are critical for consumers to be able to set up their home networks in a flexible manner.[6] In addition, enabling these features is necessary to create a level playing field among competing devices in the home network. On the other hand, PHILA/Specifications enable and require support for many anti-consumer features such as "selectable output control"[7] without providing any safeguards for product manufacturers and consumers with respect to how those features might be used. Requiring implementers to support anti-consumer capabilities with no guarantee that cable operators and content providers will respect consumer rights is not acceptable, either from a consumer perspective or from a product manufacturer perspective. Encoding rules, like those contained in the DTCP license offered by 5C, define the ways content providers may use a conditional access technology and establish a minimum set of consumer rights. For example, consumers should be guaranteed the right to record for time and space shifting purposes most programming as long as the recordings are reasonably protected against unauthorized Internet retransmission. Intel recommends that the Specifications be amended to include, e.g., "move" capability, and that a uniform set of encoding rules be included for the benefit and protection of consumers and device manufacturers alike.

4. PHILA contains many provisions that discourage entry into the market place. The license, for example, creates implementer liability not only to CableLabs but also to an extremely broad class of unnamed third party beneficiaries (content providers, cable operators, and others) for non-compliance with the PHILA/Specifications. Implementers also face the threat of injunction to stop the manufacture and sale of their products resulting from claims made by this same class of third party beneficiaries. There simply are no safe harbors for manufacturers, even if they obtain CableLabs certification for a specific product. The license also contains other over-reaching legal provisions, such as the covenants not to sue. Those provisions extend well beyond necessary or essential patent claims to implement an interface, and include the intellectual property contained in the entire product, even if only a portion of that product actually implements the Specifications. These kinds of provisions discourage adoption and Intel recommends adoption of an approach like that contemplated in the DTCP license agreement. That agreement both specifically identifies third party beneficiaries and the process for third party beneficiary claims and appropriately tailors the intellectual property provisions (such as the covenants not to sue) to narrowly cover no more than the interface itself.

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[6] Many consumers, for example, record a program in one room to watch later and then view that recording on a screen in another room.

[7] "Selectable output control" is the ability of a cable operator to "shut off" specific outputs of a consumer's device, such as the consumer's 1394 or USB connection.

5. *The certification requirement.* Certification is another area that greatly discourages makers of multiple function devices to adopt the PHILA and implement the Specifications. The certification process is extremely broad with no assurance that products will be interoperable or portable to other systems. History suggests the process will be slow, expensive, and unpredictable and interfere with product introduction.[8] The complexity of the unnecessarily referenced specifications, coupled with detailed requirements regarding form factor and other features unrelated to security, make the certification requirement a bottleneck for market entry. In large measure this bottleneck is wholly unrelated to interoperability and security. Whole product cycles and valuable business opportunities can be lost to the certification process. In addition, as pointed out above, certification does not create a "safe harbor" with respect to liability, or even guarantee interoperability. The certification process is especially troublesome for makers of multi-function, and integrated devices as the process covers the entire "device" rather than just the "Host" implementation. The PHILA creates even more uncertainty because it couples these complexities with the need to individually certify both multiple device types and each particular product configuration. This is particularly true for computer products where multiple vendors offer multiple products with multiple configurations that change on a rapid basis in order to meet consumer demand and keep up with the evolution of technology and product innovation. For example, consumers today can go to leading PC OEMs and have their PC custom configured to meet their particular needs. Each and every configuration, each upgraded or slightly changed product must be separately certified with respect to the entire device before it can enter the market. The impact that this will have on the ability of multi-function devices to be cable compatible will be immeasurable. Therefore, Intel recommends that this serious defect be remedied by self-certification.

Self-certification is standard procedure for many interoperability specifications, including many that have been approved and are being deployed by the content community. Examples include DTCP, CPPM, CPRM, HDCP and CSS for DVD Video. The fact that DTCP and HDCP are approved outputs for OpenCable Navigation Devices, and CPRM is an approved recording technology, demonstrates that self-certification is appropriate and normal, even where content protection and security principles and technologies are deployed. In this context, Intel supports the self-certification approach reflected in the CEA draft.

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[8] CableLabs has reserved the right to charge for certification, but it is unclear what the fee might be. In addition, although the proposed certification period for an OpenCable device is six weeks, we question whether that is realistic. By way of example and comparison, for DOCSIS cable modem certification, there is a $98,000. Both DOCSIS and OpenCable use the "wave" process and guidelines. In this process, whenever a product is changed in the slightest manner, that slightly changed product must be re-submitted for certification with a fee. Certification "waves" begin in relative rapid succession (a few weeks apart), usually not giving the product manufacturer adequate time to even address the reasons for failure in time for the next "wave". Each certification "wave" takes (in the case of a modem) several months. Whole product cycles can easily be missed for immaterial failures.

Summary and Conclusions.
Intel's vision of the future Digital Home is not only consistent with, but embodies, Congress' vision of the future. The principles and issues raised in our analysis are not unique to computer manufacturers but reach all market participants and ultimately all consumers. We believe the Commission shares our vision of the Digital Home, wherein all device manufacturers are able to compete openly and fairly. That vision will permit consumers to ultimately decide which selection of products, goods and services best fit their lifestyles and particular needs. Interoperability, innovation and integration create the path that leads not only to market opportunities for new and existing companies, but also to consumer satisfaction through choice, flexibility and portability.

Thank you for your consideration of these issues.

Respectfully submitted,

Donald M. Whiteside
VP Legal & Government Affairs
Intel Corporation

Cc:
Kenneth Ferree, Chief, Mass Media Bureau
Rick Chessen
Robert Pepper, Chief, Office of Plans and Policy
Amy Nathanson

Exhibit A

5C Digital Transmission Protection Specification (Use of the technology defined in this specification is subject to licensing by Digital Transmission
http://www.dtcp.com/data/).
ANSI/SCTE 01 1996 (formerly IPS-SP-400): Recommended “F” Port (Female) Specification
ANSI/SCTE 07 2000 (formerly DVS/031): Digital Video Transmission Standard for Cable Television
ANSI/SCTE 20 2001 (formerly DVS 157): Standard Methods for Carriage of Closed Captions and non-Real Time Sampled Video
ANSI/SCTE 26 2001 (formerly DVS194): Home Digital Network Interface Specification with Copy Protection
ANSI/SCTE 54 2002 (formerly DVS241): Digital Video Service Multiplex and Transport System Standard for Cable Television
ASN.1
ATSC A/52: ATSC Digital Audio Compression Standard
ATSC A/53: ATSC Digital Television Standard
ATSC A/65: Program and System Information Protocol for Terrestrial Broadcast and Cable
ATSC DASE AEE
CORBA/IIOP
DAVIC 1.4.1p9.
DFAST encryption technology (U.S. Patent number 4,860,353 and related know-how) is licensed from CableLabs as part of the OpenCable POD
DVB-MHP 1.0.2
DVB-MHP 1.1
EBU 3285
EIA 708B: Digital Television (DTV) Closed Captioning
EIA/CEA-608-B: Recommended Practice for Line 21 Data Service
EIA/CEA-770.3-C, High Definition TV Analog Component Video Interface
EIA/CEA-861B, A DTV Profile for Uncompressed High Speed Digital Interfaces Digital Display Working Group, “Digital Visual Interface,” Revision
EIA-542: Cable Television Channel Identification Plan
EIA-679-B Part B, "National Renewable Security Standard" (March 2000)
EIA-708
EIA-746A
EIA-775-A: DTV 1394 Interface Specification
EN 300 472
EN 300 743
EN 301 192
ETR 154
ETS 300 802
FCC 47 CFR Chapter 1 (10-1-98 Edition), Part 15 – Radio Frequency Devices, Class B
FCC 47 CFR Chapter 1 (10-1-98 Edition), Part 76 – Cable Television Service
FIPS PUB 140-1 “Security Requirements for Cryptographic Modules”
FIPS PUB 186-1, “Digital Signature Standard” Federal Information Processing Standards Publication (FIPS PUB), 18 May 1994, available at http
FIPS-PUB 180-1, “Secure Hash Standard” Federal Information Processing Standards Publication (FIPS PUB), January 27, 2000
FIPS-PUB 46-2 http://www.itl.nist.gov/fipspubs/fip46-2.htm
FIPS-PUB 81 http://www.itl.nist.gov/fipspubs/fip81.htm
GIF 87a
GIF 89a
HAVi
Hunt, R.W.G., ISBN: 013567686X, 1987
IEC 61966-2-1
IEEE-1394-1995: Standard for a High Performance Serial Bus
IETF RFC 1112
IETF RFC 1157
IETF RFC 1321

IETF RFC 1738
IETF RFC 1918
IETF RFC 1945
IETF RFC 1990
IETF RFC 2045
IETF RFC 2068
IETF RFC 2109
IETF RFC 2246
IETF RFC 2313
IETF RFC 2322
IETF RFC 2396
IETF RFC 2459
IETF RFC 2616
IETF RFC 2838
IETF RFC 768
IETF RFC 791
IETF RFC 793
ISO 10646-1
ISO 639.2
ISO 8859
ISO/IEC 10918-1
ISO/IEC 11172-3
ISO/IEC 13818-1
ISO/IEC 13818-2: MPEG-2 Video
ISO/IEC 13818-3
ISO/IEC 13818-6, 1998, Information technology-Generic coding of moving pictures and associated audio information: Extensions for Digital Stora
ISO/IEC 18318-1, Generic Coding of Moving Pictures and Associate Audio System
ITU-R BT.601
ITU-R BT.709
ITU-R-BT.709-2, Parameter Values for the HDTV Standard for Production and International Program Exchange
ITU-T Recommendation X.509, Information technology - Open Systems Interconnection - The Directory: Public-key and attribute certificate frame
ITU-T X.501
ITU-T X.509
ITU-T X.520
Java Language Specification (JLS), ISBN 0-201-63451-1
Java Media Framework (JMF)
Java TV Java VM
JFIF
JSSE
JVM Errata
JVM Inner Classes
NRSS, EIA-679 Part B.
OCAP 1.0 SRS
OC-HOST-CFR-I10-020628, OpenCable Host Device Core Functional Requirements.
OC-SP-ADVHOST-CFR-D01-020412
OC-SP-CDS-IF-I03-020524, OpenCable Common Download Specification, May 24, 2002, Cable Television Laboratories, Inc., <www.opencable.
OC-SP-HOSTPOD-IF-I10-020524, OpenCable Host-POD Interface Specification, May 24, 2002, Cable Television Laboratories, Inc., <www.open
OC-SP-OCAP1.0-I03-020724, OpenCable™ Application Platform Specification (OCAP) 1.0
OC-SP-OCAP2.0-I01-020419, OpenCable Application Platform Specification (OCAP) 2.0.
OC-SP-PODCP-IF-I07-020524: OpenCable POD Copy Protection System Specification

PersonalJava (PJAE)
PHILA
PNG POSIX
RFC 2459, “Internet X.509 Public Key Infrastructure Certificate and CRL Profile”, R. Housley, W. Ford, W. Polk, D. Solo, January 1999
RSA1, “PKCS #1: RSA Encryption Standard”, Version 1.5, RSA Laboratories, November 1993
RSA2, “PKCS #1 v2.0: RSA Encryption Standard”, Version 2.0, RSA Laboratories, October 1, 1999
SCTE 07 (formerly DVS/031)
SCTE 08 (formerly DVS 011)
SCTE 18 (formerly DVS/208)
SCTE 20 (formerly DVS 157)
SCTE 26 2001 (formerly DVS/194), Home Digital Network Interface Specification with Copy Protection
SCTE 28 2001 (Formerly DVS 295) HOST-POD Interface Standard
SCTE 40 2001 (formerly DVS313): Digital Cable Network Interface Standard
SCTE 41 2001 (Formerly DVS 301) POD Copy Protection Standard, Society of Cable Telecommunications Engineers, http://www.scte.org/stand
SCTE 42 (formerly DVS/311)
SCTE 43 2001 (formerly DVS/258), Digital Video Systems Characteristics Standard for Cable Television High-bandwidth Digital Content Protecti
SCTE 55-1 2002 (formerly DVS 178): February 25, 2002, Digital Broadband Delivery System: Out of Band Transport Part 1: Mode A
SCTE 55-2 2002 (formerly DVS 167): March 10, 2002, Digital Broadband Delivery System: Out of Band Transport – Mode B Part 2: Mode B, Soc
SCTE 65 2002 (formerly DVS234): Service Information Delivered Out-of-Band for Digital Cable Television
SCTE DVS 053r7
SCTE DVS 131r7
SCTE DVS 161r2
SCTE DVS 216r4
SCTE DVS/321r2
SMPTE D27.003.020
SP-BPI+-I08-020301, CableLabs Data-Over-Cable Service Interface Specification, Baseline Privacy Plus Interface Specification, March 1, 2002
SP-CMCI-IO3-991115
SP-DSG-I01-020228, DOCSIS Set-top Gateway (DSG) Interface Specification.
SP-OSSIv1.1-I05-020301, Data-Over-Cable Service Interface Specifications, Operations Support System Interface Specification.
SP-RFIv1.1-I08-020301, Data-Over-Cable Service Interface Specifications, Radio Frequency Interface Specification.
TR 101 194
TR 101 202
TS 101 812