

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of:)
)
Implementation of Section 304 of the) CS Docket No. 97-80
Telecommunications Act of 1996)
)
Commercial Availability of Navigation Devices)
)

To: The Commission

**REPLY COMMENTS OF
KING COUNTY, WASHINGTON
AND
THE NATIONAL ASSOCIATION OF TELECOMMUNICATIONS OFFICERS
AND ADMINISTRATORS**

KING COUNTY, WASHINGTON

Marlin Blizinsky
Senior Regulatory Affairs Officer
700 Fifth Avenue
Suite 2300
Seattle, Washington 98104
(206) 296-3877

Marcine Anderson
Senior Deputy Prosecuting Attorney
500 Fourth Avenue
Suite 900
Seattle, WA 98104

**THE NATIONAL ASSOCIATION
OF TELECOMMUNICATIONS
OFFICERS AND
ADMINISTRATORS**

Elizabeth Beaty
Executive Director
1650 Tysons Boulevard
Suite 200
McLean, VA 22102
(703) 506-3275

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King County, Washington (“County”), a political subdivision of the State of Washington, and The National Association of Telecommunications Officers and Advisors (NATOA), a professional association made up of individuals and organizations responsible for (or advising those responsible for) telecommunications policies and services in local governments throughout the Country, pursuant to Section 1.415 of the rules of the Federal Communication Commission (“FCC” or “Commission”), 47 C.F.R. § 1.415, hereby respectfully submit their comments in response to the Commission’s Further Notice of Proposed Rulemaking and Declaratory Ruling *In the Matter of Implementation of Section 304 of the Telecommunications Act of 1996 (“1996 Act”): Commercial Availability of Navigation Devices* (“Further Notice”).¹ As discussed below, the Commission’s current Navigation Device Rules have not and cannot lead to the consumer choice in the Navigation Device market envisioned by Section 629 of the Telecommunications Act of 1996 (“Act”).² Because of this, the Commentors strongly urge the Commission to take the steps discussed below to help achieve Section 629’s objectives.

¹ CS Docket 97-80, FCC 00-341, 15 F.C.C Rcd ____, 65 Fed. Reg. 58255 (rel. Sept. 18, 2000).

² Section 629(a) provides: “The Commission shall, in consultation with appropriate industry standard-setting organizations, adopt regulations to assure the commercial availability, to consumers of multichannel video programming and other services offered over multichannel video programming systems, of converter boxes, interactive communications equipment, and other equipment used by consumers to access multichannel video

I. KING COUNTY'S AND NATOA'S INTERESTS IN THIS PROCEEDING

The County and NATOA (jointly "Commentors") appreciate this opportunity to submit reply comments in this proceeding. King County is a local franchising authority for cable television system operators and other Multichannel Video Programming Distributors ("MVPD"). Its franchise agreements include provisions regarding system equipment, as well as the standards for customer premises equipment that will be attached to the system.³ Our citizens care about the uses they can make of these systems, and the County has an interest in this, as well.

NATOA's mission is to support and serve the telecommunications interest and needs of local governments. NATOA's purpose in joining these reply comments results from its concerns on behalf of consumers represented by NATOA's constituency. NATOA joins in support of King County, Washington, as a member organization with mutual interests in this proceeding.

Washington State and King County are among the centers of the high technology world. 10.4% of the total employment in our state resides in technology-based businesses, and the number of such private sector jobs has grown at an annual rate of over 6 percent. Software service jobs have grown at

programming and other services offered over multichannel video programming systems, from manufacturers, retailers, and other vendors not affiliated with any multichannel video programming distributor. Such regulations shall not prohibit any multichannel video programming distributor from also offering converter boxes, interactive communications equipment, and other equipment used by consumers to access multichannel video programming and other services offered over multichannel video programming systems, to consumers, if the system operator's charges to consumers for such devices and equipment are separately stated and not subsidized by charges for any such service."

³ For example, Franchise Agreement No. 12132 provides: "The System including headend, distributive network, and customer premises equipment shall be an "open" network. The Franchisee must take affirmative steps, including in its design, research, procurement and contracting practices so that the System operates as an "open" network as far as reasonably possible initially and so that openness is maintained and enhanced throughout the Franchise term. An "open" system shall have at least the following characteristics. The standards for the hardware interfaces and software protocols used by the system, other than those required to maintain network integrity and security, the protection of copyrighted information or those protocols utilized to bill subscribers or programmers of the network for network usage -- including at the node, headend and at customer premises -- shall be published and generally available." § 16(b). And, "Subscribers shall have the right to attach devices to the Franchisee's System to allow them to retransmit signals or services when authorized by the Franchisee. Subject to reasonable provisions to prevent signal and service theft, subscribers also shall have the right to use their own remote control devices and converters, and other similar equipment and, if possible, the Franchisee shall provide information to consumers which will allow them to adjust such devices so that they may be used with the Franchisee's System." §24(c)(1).

an annual rate in excess of 35%. Technology-based businesses are now the State's largest industry sector.^{4,5}

King County is home to many of these high technology businesses. Real Networks, Amazon.com, Microsoft, Visio, and other such businesses have their headquarters here.

These companies create highly desirable jobs. The average annual wage for these jobs was over 77% greater than the statewide average.^{6,7} And locally, personal income exceeded the national average by 41% in 1996.⁸ In addition, each technology-based job has generated 3.36 additional jobs, a rate in excess of the state average.⁹ Technology and communications issues are of crucial importance to the economic and social health of King County.

It is widely understood that these businesses depend on communications services to accomplish their work and to distribute their products. Thus, the Washington State Technology Alliance recently stated that the availability and composition of high-capacity communications services, such as those offered over cable and other video systems, are "essential to the vitality and competitiveness of our state. [They have] an impact on a wide variety of public and private sectors, including: education, commerce, transportation, entertainment, and health care – just as railroads, highways, and other means of transportation did in previous generations." For this reason, the Alliance concluded, "it is in the best interest of the state to actively encourage investment and deployment of these technologies."¹⁰

Put in a slightly different way, users of multichannel video programming systems play a dual role with regard to these systems: they are both consumers and producers of some of the material

⁴ William B. Beyers and Peter B. Nelson, *The Economic Impact of Technology-Based Industries on Washington State in 1997*, A Technology Alliance Report (Seattle, 1998). Available at: <http://www.technology-alliance.com/publications/97fullimpact.html>.

⁵ The figures for Washington state are substantially in excess of the national figures. For somewhat comparable figures for the national economy, see: U.S. Dept. Of Commerce, *The Emerging Digital Economy II* (1999), Chap. 2. Available at: <http://www.ecommerce.gov/ede/>.

⁶ Beyers and Nelson, *supra* note 4.

⁷ This corresponds to the differential between IT-producing industries and private sector jobs nationally. *Id.* at 39.

⁸ King County, Washington, 1998 King County Annual Growth Report (Seattle, 1998).

⁹ Beyers and Nelson, *supra* note 4.

¹⁰ Tom Alberg, Senator Bill Finkbeiner, Ed Lazowska, and Dan Rosen, *Policy Initiatives to Increase the Availability of Advanced Telecommunications Services Throughout Washington State*, A Report of the Technology Alliance (Seattle, 1999). Available at: <http://www.technology-alliance.com>.

seeking to run over the systems. The Commission recognized these dual roles by including “interactive equipment” in its definition of navigation devices.¹¹

II. INTRODUCTION

For many years, cable system operators and other MVPDs have leased customer premises equipment, such as set-top boxes, to customers. These boxes have served two functions. One function is to maintain the integrity of service by insuring that only paying customers are able to receive service over the system. The second function is to allow customers to select among and enable programs and services. While these functions are separate and could reside in separate pieces of equipment, video providers, seeking to retain control over the selection and enabling functions while maintaining the security of their services, have traditionally leased customers a single box combining the functions. In addition, these boxes have been purchased from a small group of box manufacturers closely allied with video providers.

It is this monopolization of the box market Congress sought to break. In the 1996 Act, Congress directed the FCC to adopt rules that would result in customers being able to purchase such devices from vendors unaffiliated with the MVPDs¹² in an attempt to foster “innovation, lower prices and higher quality” through competition.^{13, 14} Such devices are not widely available now,¹⁵ and additional Commission action is required if we are to reach the situation Congress properly envisioned.

III. SECTION 304’S GOAL OF FOSTERING A COMPETITIVE NAVIGATION BOX MARKET IS BEST ADVANCED BY PROHIBITING MVPDS FROM PROVIDING MOST NEW EQUIPMENT BY JANUARY 1, 2002.

¹¹ Section 76.1201(c) defines navigation devices as “converter boxes, interactive equipment, and other equipment used by consumers within their premises to receive multichannel video programming and other services offered over multichannel video programming systems.” 47 C.F.R. § 76.1201(c).

¹² 47 U.S.C. §629.

¹³ H.R. Rep. No. 102-204, 104th Congr., 1st Sess. 112 (1995).

¹⁴ In a competitive market these selection and enabling functionality may ultimately reside in separate boxes, in televisions or other appliances, or in some combination of the two.

¹⁵ See e.g., Broadband Access Systems, *Service Delivery over Cable Networks... The Need for a New Paradigm*. Available at: <http://www.cabledatcomnews.com/whitepapers/paper02.html>.

A. MVPDs have exceptional advantages in the marketing of boxes, even if they treat competitive box manufacturers and retailers in a nondiscriminatory way.

The Commentors agree with the Commission's conclusion that "MVPDs continued ability to provide new integrated equipment¹⁶ combining both security and non-security functions would likely interfere with the statutory mandate of commercial availability."¹⁷ This conclusion results from the natural competitive advantages MVPDs possess vis-à-vis other box providers. These advantages are strongest when the security and non-security functions are integrated in a single unit, but are present even when they are not. In addition, at least one of these advantages exists even when an MVPD does not intentionally discriminate against potential competitors. Thus, if one's goal is to maximize the competitiveness of the navigation box market it is necessary to address these advantages by barring MVPDs from participating in the non-security segment of the market, except as discussed in Subsection B below.

MVPDs have at least two potential market advantages in the sale of navigation boxes, their relationship with service customers and their ability to disadvantage potential competitors through the MVPDs' superior knowledge of their delivery systems. The first advantage is present so long as MVPDs are able to sell or lease integrated boxes, and does not disappear even when they treat other box makers and marketers in a nondiscriminatory manner.

Boxes are a nuisance for service customers – going out and getting them, hooking them up, fixing them when they break.¹⁸ The installation of service is also a nuisance, especially if one must wait for someone to come to your home to arrange service. Customers naturally favor solutions they perceive as most convenient, other factors being equal. Arranging for the delivery of a box when ordering service and having the box delivered and installed when service is installed is the most

¹⁶ The County is not suggesting that MVPDs be barred from leasing or selling off the boxes they have in stock when the ban takes effect if MVPD do not stockpile boxes between now and the date of the ban to circumvent its purpose.

¹⁷ Further Notice at 4, citing *Implementation of Section 304 of the Telecommunications Act of 1996: Commercial Availability of Navigation Devices*, Report and Order ("*Navigation Devices Order*"), 13 FCC Rcd at 14799.

convenient customer solution. Only MVPDs are present to market boxes at the point of service sale. Customers are likely to choose more burdensome, unbundled alternatives only if they perceive the alternatives as possessing significantly greater features and/or lower prices.¹⁹

MVPDs have another related customer advantage. The best list of potential box customers is the list of current service customers and service applicants. Service lists and direct contact with service applicants enable MVPDs to target marketing to these groups; without such lists and contacts, competitive box sellers cannot target their marketing. Also, if they do a good job of service, an MVPD may have established a positive relationship with existing customers that predispose them to look to their MVPD for equipment.

This customer relationship is the MVPD's ultimate box advantage. This advantage is not limited to navigation boxes: it is present for other consumer goods related to the use of cable services including televisions, VCRs, and DVD players which MVPDs do not sell. Note too, the advantage does not depend on any ill will on an MVPD's part.

The industry's potential ability to deter competition is also based on its superior knowledge of its systems: if the MVPD knows technical details about its system that others do not, this creates the opportunity for it to design a superior box for that system. Some commentators have questioned the cable industry's desire to share the necessary technical information and establish the necessary standards required to foster a competitive box market given its history of collecting revenue for leasing boxes to service customers.²⁰ Companies such as AT&T counter that not only have they acted to create a vibrant competitive market²¹ but that it would be unwise for them to act otherwise.²² In addition, companies such as Philips note that they have had meaningful involvement in the development of the

¹⁸ This nuisance potentially increases when multiple box choices are available. Then customers must also decide what brand and model to select.

¹⁹ Some observers would argue that cable companies subsidize the cost of boxes, and that boxes purchased on the open market would be more costly. This would appear to be economically irrational unless it resulted in greater profit and/or control in the long run. More likely the cost of boxes is absorbed into overall equipment costs and passed along to customers as a group with MVPDs keeping a keen eye out for the steps necessary to retain control over their systems.

²⁰ E.g., Comments of the Consumer Electronics Association to the Further Notice, Nov. 15, 2000 at 6-16.

²¹ E.g., Comments of AT&T Corp. to the Further Notice, Nov. 15, 2000 at 12.

OpenCable standard despite not being a CableLabs member.²³ The Commentors take no position on the question of the cable industry's motivation, nor is the answer crucial to determining the best course of action in this proceeding. What is clear, however, is that MVPDs have significant built-in advantages over potential competitors, and the opportunity to garner additional advantages should they choose.

B. Given their inherent market advantages, full competition will not occur if MVPDs are allowed to market most boxes. Thus, MVPDs should be banned from selling and leasing new equipment unless they demonstrate that the public interest requires it.

Regardless of whether they agree with this reasoning, MVPDs concur in the result. As a recent Cable World article stated: “[C]able industry sources argue customers won’t buy higher-priced set-tops from a retailer once they know they can lease one for less from their cable provider.”²⁴ Thus, the Commission must choose between 1) a box market with MVPD participation,²⁵ and decreased opportunities for competitors and innovation or 2) a box market without MVPD participation, but with increased opportunities for competitors, innovation, and other potential customer benefits.²⁶ We believe the benefits of true competition will exceed the burdens of moving from the current monopolistic situation. Given this, we would ban MVPDs from marketing equipment, except in very limited circumstances.

The ban should give way, in part, when there is a clear public interest in doing so.²⁷ The problems present here, a natural tendency toward concentration rather than competition, are especially acute whenever a new, desirable service is developed. MVPDs should not be banned from offering a box plug-in containing a new service if doing so would significantly lessen the available efficiencies or

²² Id. at 5-8.

²³ Comments of Philips Electronics North America Corp. to the Further Notice, Nov. 15, 2000 at 2.

²⁴ David Connell, *Waiting for Set-Tops*, CABLE WORLD (Nov. 27, 2000). Available at: <http://www.telecomclick.com/magazinearticle.asp?magazineid=1&releaseid=2105&magazinearticleid=1372>.

²⁵ Together with its natural advantages and its potential for discrimination (and thus the potential need for government oversight).

²⁶ It is possible there will be a period of difficulty as we begin the time when MVPDs no longer provide new boxes. There are strong forces wanting vibrant markets for cable-delivered services, however, and there will be strong incentives to rapidly resolve such difficulties through discounts or other means.

offerings. To remove the ban for the single service only, an MVPD would need to obtain a waiver upon a proper showing made to the Commission.

Others²⁸ have suggested the appropriate test in this context is the one used for telephone customer premises equipment under Section 64.702(e).²⁹ That test provides:

[u]nder the waiver standard, a carrier must demonstrate both that: (1) the offering of particular functions as part of the network service will serve the public interest by increasing the efficiency, or making technically possible the delivery of a particular service; and (2) provision of those functions through unregulated CPE will not permit attainment of comparable efficiencies or service offerings.³⁰

We believe the test is sufficient for some purposes but not broad enough to cover all possible situations where a waiver would be desirable. A waiver should be granted when this first test is met but also when an MVPD is the only organization wanting to deploy a new technology. Under this second test, an MVPD would need to show that the standards necessary to produce the new functions are open and generally available to manufacturers under reasonable conditions, and that the box industry has not signed an agreement to include or make available the new functionality in at least some of its boxes within one year of the standards being made generally available.

C. The ban should be put into effect by January 1, 2002.

If competition is best fostered by a box market that excludes MVPDs in most instances, that exclusion should be put into place as soon as practicable. While there could be valid reasons for delaying the ban -- the inability of the market to produce boxes in a timely way or extreme unfairness to MVPDs, for example -- those conditions do not appear to be present here.³¹

²⁷ It is our view that boxes will consist of a case into which a POD and other modular components plug.

²⁸ E.g., *Supra* note 20 at 25.

²⁹ 47 C.F.R. §64.702(e).

³⁰ *In the Matter of NYNEX Telephone Companies Tariff F.C.C. No. 1 – Applications for Review*, Memorandum Opinion and Order, 8 FCC Rcd 7684, 7687 (citing *In the Matters of Amendment to Sections 64.702 of the Commission’s Rules and Regulations (Third Computer Inquiry)*, et al., CC Docket No. 85-229 (Phase II), Memorandum Opinion and Order on Reconsideration, 3 FCC Rcd 1150, 1167-68 (1988) (“*Computer III, Phase II Reconsideration Order*”).

³¹ We recommend the Commission be empowered to extend the date of the ban up to one calendar year upon the industry showing 1) the available boxes are not compatible across a majority of the cable systems in the country, and 2) it has made full good-faith efforts to comply with the Order including meeting the date for the ban. In addition, the Commission should sanction the industry if either of these prior conditions are not met.

AT&T and Cable Labs have stated that the market will soon make advanced technology boxes available. Given this, moving the date for the ban back to January 1, 2002, will not deprive customers of access to those boxes. AT&T notes that it has “a number of relationships with leading consumer electronics manufacturers and retailers, including Philips, Panasonic, and Best Buy, for the development, deployment, and marketing of advanced digital set-top boxes at retail, and is already conducting trials with Circuit City for the marketing of digital cable service and the sale of ‘integrated’ set-top boxes.”³² A CableLabs® flyer³³ handed out at the 2000 Western Show indicated there were multiple demonstrations of equipment compatible with the OpenCable standard including nine companies demonstrating “Advanced Set-Top Boxes/POD Technology,” three companies demonstrating “OpenCable Applications Platform[s],” seven companies demonstrating “Innovative Hardware Solutions,” and twelve companies showing “Interactive Television Applications and Services.” The flyer goes on to say that these are items “that cable operators may soon deploy – usually within 18 months of the exhibit.”³⁴ The list is not complete. At the same Show, C-Cube stated that it has for sale an OpenCable compliant Interactive Cable Transceiver, the CL2151-MultiLynx™ Universal HFC.³⁵ There is nothing to indicate that companies could not continue these efforts without MVPDs’ direct involvement.

Moving the date of the ban to 2002 would need to be examined in greater detail if MVPDs had invested large sums of money but were not going to have the opportunity to recover it. That has not been shown. The Commission has expressed concern that it would take several years for MVPDs to recover their investments in boxes.³⁶ If the Commission acts quickly to change the ban date (as it has proposed) there will be less investment to recover. In addition, the Commentors do not object to

³² *Supra* note 20 at 2.

³³ Flyer attached.

³⁴ *Id.*

³⁵ Flyer attached.

³⁶ See Report and Order *In the Matter of Implementation of Section 304 of the Telecommunications Act of 1996: Commercial Availability of Navigation Devices*, CS Docket 97-80, FCC 98-116, 13 FCC Rcd 14775, 14803 (rel. June 24, 1998) and Order on Reconsideration *In the Matter of Implementation of Section 304 of the Telecommunications Act of 1996: Commercial Availability of Navigation Devices*, CS Docket 97-80, FCC 99-95, 14 FCC Rcd 7596, 7612 (rel. May 14, 1999).

companies recovering legitimate box-related costs.³⁷ Therefore, the Commentors support introducing competition into the market by banning MVPDs from selling and leasing new boxes after this earlier date unless the Commission grants a waiver.

IV. THE COMMISSION’S STANDARDS POLICIES MUST PROTECT CONSUMERS’ INTERESTS, INCLUDING THEIR INTERESTS IN ALREADY PURCHASED EQUIPMENT, AND MANUFACTURERS’ INTERESTS, AS WELL AS THE INTERESTS OF MVPDS

A. The Commission must mandate that equipment and software be interoperable and backward compatible.

Consumers care a great deal about interoperability – equipment that is not interoperable is often unusable. Interoperability arises in at least three situations: equipment must work on differing systems, equipment must work with other equipment on a single system, and equipment must continue to work even after the market produces newer models of the same equipment or service. Many commentators in this proceeding have spoken of the need for interoperability in the first sense. We agree.

We would add that equipment useable on multiple systems is especially important as systems are increasingly overbuilt.³⁸ If a person must buy new boxes to switch systems because the old ones don’t work on the competitive system, this serves as a strong disincentive to switch systems and, thus, would be a barrier to competition. To help avoid this, whenever a MVPD chooses new equipment precluding the use of existing customer equipment or functions provided by the old equipment, the Commission should monitor, on a complaint basis, whether there is a strong reason for choosing such equipment other than the injurious effect on customers. Similarly, MVPDs should not be allowed to disable information included by the content providers transmitting over their systems.³⁹

³⁷ Including those shown to have not resulted from attempts to stockpile boxes before the phase-out date.

³⁸ Some areas in King County are overbuilt and additional areas will be soon.

³⁹ See Comments of Gemstar-TV Guide Intl. Inc. and Gemstar Dev. Corp. Comments to the Further Notice at 2-3.

As POD-compatible boxes are deployed, we can anticipate additional functionality residing on other cards that could also be added to a box. The prognosis for these functional add-ons depends on standards enabling them to work with existing functionality.

Perhaps most important to consumers, the introduction of new technologies should not make their existing equipment useless. Consumers already face such threats. As Philips pointed out in its comments, it “is concerned about potential limitations on analog outputs in navigation devices [because] [s]ome of these restrictions would result in backward compatibility problems with legacy analog-only input HDTV monitors already in consumers’ homes.”⁴⁰

To prevent such harm, the Commission must require all new equipment to be backward compatible-capable. Key standards, such as the OpenCable Middleware Specification, (“OCAP”), should also provide for this. The Commentors understand how consumer electronics equipment manufacturers and retailers might be concerned about the cost of such compatibility. Using modular components, equipment sellers could offer a choice between new equipment without backward compatibility and higher cost equipment with it. Consumers would then be free to decide which version to buy.

B. The Commission’s standards must promote openness and the availability of necessary technical information.

Innovation depends on open and available standards. The Commission must require MVPDs to make the technical specifications for new services available and licensable on reasonable terms. If necessary and upon request, the Commission should develop standard licensing agreements to assure this. Absent compelling reasons to the contrary, MVPDs should not be allowed to offer new services unless the standards for those services meet these criteria.

The Commission should also consider, in a further proceeding, rules regarding when MVPDs should be prohibited from entering into exclusive contracts for the licensing of technologies that enable

⁴⁰ [Supra note 19 at 5.](#)

services.⁴¹ In addition, MVPDs should not be allowed to hold a significant ownership interest in companies manufacturing equipment unless there is real separation in the control of the two companies.

C. The Commission must be flexible about the standards it adopts.

As the Commission noted in the Further Notice, Section 629 and this proceeding cover a wide variety of equipment and services delivered over multichannel video programming systems.⁴² The trick with standards is, of course, how to provide enough certainty to encourage producers to develop high-cost content and manufacturers to build equipment without freezing technology and stifling innovation. The goal should be for the adopted standard to enable a range of devices.

In addressing this problem, Microsoft noted in another proceeding that there are a number of situations where multiple interfaces may be necessary.⁴³ It cited the IEEE's 1384 standard as an example. The interface is excellent for a number of uses but is inadequate for uncompressed HDTV.⁴⁴ In addition, there appear to be interoperability problems with the standard.⁴⁵ In such situations, the Commission must exercise caution in codifying specific standards.

In addition, standards should sunset after a period of three years. New standards should be announced⁴⁶ at the beginning of year one, and remain in place until the end of the third calendar year. At the beginning of the third calendar year, or at such other time as the Commission established, the next standard should be announced. The new standard should maintain backward compatibility. The Commission should be empowered, either upon the general agreement of all key industry segments or its own initiative, to alter these timelines in particular instances to foster innovation or extend the life of an existing standard when the path of innovation is unclear.

⁴¹ The Commission has had to deal with similar issues in other proceedings. See 47 U.S.C. §§ 536(a) and 548(c).

⁴² *Supra* note 1.

⁴³ Kilroy Hughes, Dave Marsh, Tom McMahon and Skip Pizzi, *A White Paper on ASTB, IDTV & HDTV Display Interoperability In the Year 2000 and Beyond*, MICROSOFT CORP. (Sept. 11, 2000) at 13, submitted in conjunction with Microsoft Corporation's Letter Comments submitted in PP Docket 00-67 (Sept. 7, 2000).

⁴⁴ *Id.* at 6-7.

⁴⁵ Junko Yoshida, *1394 Interoperability Still a No-Show*, EE TIMES.COM (Nov. 27, 2000). Available at: <http://www.eetimes.com/story/OEG20001127S0016>.

⁴⁶ It is anticipated the interested industries would take the lead in developing the actual standards. The Commission would 1) set out the need for a new standard to be developed and a process and timeline for

V. CONCLUSION

For many years, MVPDs have tightly controlled the equipment customers use in conjunction with the MVPDs' service. There is no good reason for that control to continue. Removing it to foster innovation, quality, and lower costs depends on strong Commission action – getting MVPDs out of the equipment business by January 1, 2002, (except in limited circumstances), taking a flexible and open approach to standards, guaranteeing customers can continue to use the equipment they already own, and limiting the unnecessary removal of content. We urge the Commission to take these steps to bring all market segments the benefits of competition.

Respectfully submitted,

/s/ Marlin Blizinsky

/s/ Elizabeth Beaty

Marlin Blizinsky
Senior Regulatory Affairs Officer
King County, Washington
700 Fifth Avenue
Suite 2300
Seattle, Washington 98104

Elizabeth Beaty
Executive Director
NATOA
1650 Tysons Boulevard
Suite 200
McLean, VA 22102

Marcine Anderson
Senior Deputy Prosecuting Attorney
King County, Washington
500 Fourth Avenue
Suite 900
Seattle, WA 98104

developing it; 2) assure the timeline has been met; and 3) establish its own standard and/or assess penalties if the timelines were not met.

ATTACHMENTS



OpenCable Vendor Demos at CableNET

CableNET is a demonstration of the applications, services, hardware and software that cable operators may soon deploy—usually within 18 months of the exhibit. The types of services and applications exhibited at CableNET is limitless, bounded only by the ability of the service and/or application to work on a cable system or in the home as an extension of cable-delivered services.

The OpenCable team is pleased to present a number of CableNET demonstrations exhibiting OpenCable features. The hardware and software demonstrations you see here today were carefully selected based upon the following criteria:

- Compatibility with existing OpenCable specifications
- Level of technology innovation
- Readiness for deployment
- Efficiency of solutions offered to the cable provider
- Degree of consumer benefits enabled by the technology
- How well the demo leverages the power of the broadband communications pipe.

We think the following OpenCable demonstrations (presented in alphabetical order) are of particular interest, and we hope you will take the time to visit them.¹

Advanced Set-Top Boxes/POD Technology

Broadcom Corporation
Microsoft Corp.
Mindport
Motorola Broadband Communications Sector
Pace Micro Technology

Panasonic
Scientific-Atlanta
TeraLogic, Inc.
Thomson Consumer Electronics

Innovative Hardware Solutions

Cisco Systems, Inc.
ICTV, Inc.
Margi Systems, Inc.
Microtune, Inc.

Panja Inc.
Triveni Digital
Ward Laboratories Inc.

Interactive Television Applications and Services

Canon
Commerce.TV
IBM
Keen Personal Media
Mindport
Navic Networks, Inc.

NDS
Qbeo, Inc.
respondTV
SeaChange Corporation
SpotOn
WorldGate

OpenCable Applications Platform Vendors

OpenTV
Microsoft Corp.
Sun Microsystems

¹ Source: Jupiter Communications

² Sources: Paul Kagan Associates, Forrester Research

³ Vendors listed more than once are either showing multiple demonstrations, or their demos fit more than one category.



OpenCable™ at CableNET® 2000: "What's Next" ...for Interactive Television.

It's Winter 2000, and interactive television (iTV) via cable is finally here. Its rollout continues to be a complex process, with disagreements along the way about everything from hardware decisions to viable business models to platform selection. But nonetheless, the reality is that some form of interactive cable television service is now available in perhaps 1 million cable homes, with forecasted growth to 30 million deployments by 2004¹. Projections in dollars are equally astounding. Published forecasts indicate the 2000 iTV market value will range from \$728 to \$848 million, and growth by 2005 is anticipated to reach (depending on which analyst you ask) anywhere from \$15 to \$48.2 billion by 2005². Compounded annually, iTV over cable could see a phenomenal growth rate of 124 percent. And starting in 2001, OpenCable will be a huge contributor to this exponential growth.

OpenCable Background

OpenCable was first launched as a CableLabs® initiative in 1997, following the Telecommunications Act of 1996, in which Congress mandated that cable subscribers be allowed to own their own equipment. To accomplish this, the Act directed the FCC to create rules that would allow consumers to obtain set tops and other equipment from commercial sources, such as retailers, manufacturers and other outlets besides cable operators. Subsequent FCC rules directed cable operators to have available separable, removable security modules (called Point of Deployment, or POD, modules) by July 1, 2000. A POD module enables a device to decode encrypted, or scrambled, content that crosses the POD-host interface, and a "host" is whatever device is being used to receive and send communications. The host device may be a set-top box or an integrated digital television receiver, and will eventually include other advanced digital devices such as personal digital assistants, MP3 players, and Internet appliances.

In short, the goal of OpenCable is to create a common set of requirements for digital cable set-top equipment (and other digital devices) to provide interoperability and portability for interactive TV services, enable competitive retail distribution of these products, and test and certify interoperability of OpenCable devices.

A Look Back at 2000

2000 was a groundbreaking year for OpenCable. Following the completion of the OpenCable hardware specification in October 1999, the OpenCable team at CableLabs met the July 1 deadline for making set-top boxes with removable security—POD modules—available for retail distribution. CableLabs' role was to verify POD modules for interoperability, and PODs manufactured by two vendors—Motorola and Scientific-Atlanta—met the criteria. As a result, PODs are now available directly from the cable operator to customers who request them.

In addition, the OpenCable team is presently involved in its fifth OpenCable Certification Wave, in which the following companies are participating: Scientific-Atlanta, Motorola, Panasonic, LG Electronics, Harmonic, and SCM-Microsoft. To date, 15 companies have participated in the OpenCable testing process, and more than 400 are able to review and contribute to specifications currently being developed.

What's Ahead in 2001

OpenCable Applications Platform (OCAP)

OCAP, part of the OpenCable specification, is now under development. OCAP is a layer of software residing in a set-top box (or other device) that may be built by any hardware vendor, using any operating system. Interactive service developers can write to this common authoring environment just once, and their services can be deployed anywhere. This service portability benefits customers and cable operators by making more interactive services available more quickly. OCAP also benefits service developers by saving them time and energy, which helps keep development costs down. CableLabs is targeting an OCAP completion date of first quarter 2001.

Forum for OpenCable Interactive Services (FOCIS)

OCAP developers can get involved with OpenCable through FOCIS, the Forum for OpenCable Interactive Services. FOCIS is a forum designed to support developers of interactive content, services and applications for use in advanced set-top boxes. FOCIS will facilitate information sharing and collaboration for the OCAP specifications as they are being written. This will allow the developers who need the OCAP specs the most to actually influence and comment on the specs, *before* they are finalized.

For more information on FOCIS, OCAP, or OpenCable in general, please visit www.opencable.com.

www.opencable.com

CL2151 - MultiLynx™ Universal HFC

INTERACTIVE CABLE TRANSCEIVER

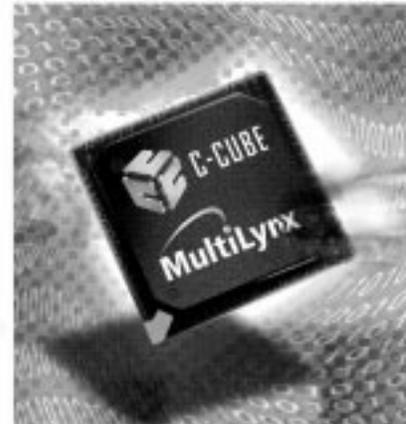
OVERVIEW

The C-Cube CL2151 is a universal cable transceiver solution for advanced set-top boxes and cable modems compliant with DVB/DAVIC, and DOCSIS standards. The CL2151 is built for set-top box and cable modem manufacturers requiring the maximum performance with the lowest system BOM cost. Its high level of integration provides manufacturers with a quick time-to-market yet flexible solution for standards based deployments all over the world.

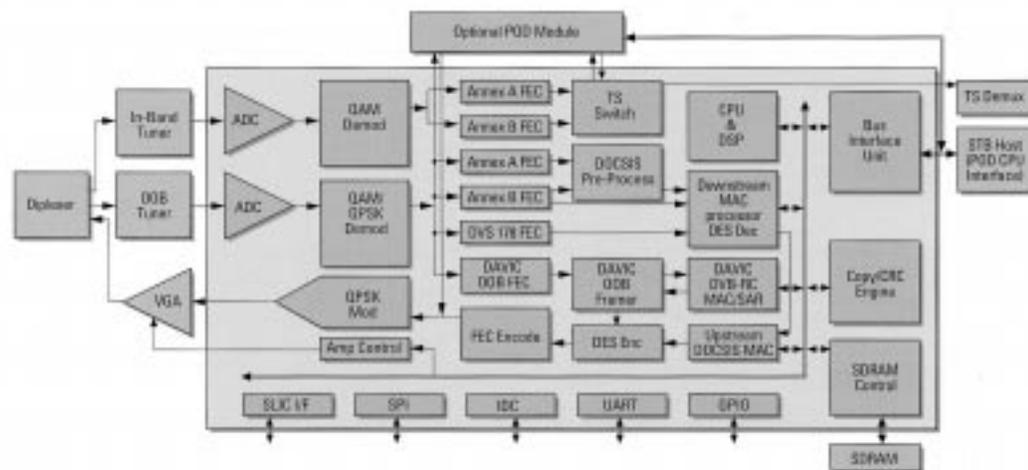
The CL2151 is a complete and highly integrated solution combining a 16-256 QAM in-band receiver, QPSK/QAM receiver for out-of-band downstream reception, a QPSK/16-QAM burst transmitter, and a proven DAVIC/DVB and

DOCSIS 1.0/1.1 Media Access Controller. The chip includes a RISC processor with DSP instruction set enabling glueless interface to subscriber line IC's (SLIC's) and a POD interface.

The CL2151 inband demodulator is a 16-256 QAM and FEC fully compliant to ITU-T J83 Annexes A, B, and C. A second out-of-band downstream channel provides an option to use a QPSK or full 16-256 QAM demodulation, allowing for flexible implementation for DOCSIS, DVB/DAVIC or DVS 178 without changing any external components. Both channels are compliant with ITU J.83 Annex A,B, and C and integrate a 10 bit A/D converter.



The upstream QPSK/16-QAM burst transmitter along with ITU J.112 Annex A, B compliant FEC encoding provides a robust and cost effective solution for DVB/DAVIC, and DOCSIS applications.



High Level Block Diagram of CL2151



A field proven HW/SW MAC for DOCSIS and DVB/DAVIC (with packet parsing; ATM segmentation and reassembly) is available on the CL2151. The SW portion of the solution executes on two internal processors – an 88 MHz mini-RISC and 117 MHz SPARC v8 processor. This processor implementation takes the complete burden off the STB host and provides for efficient system architecture.

The CL2151 is OpenCable compliant by supporting OOB data to be bypassed to a POD interface for MAC processing. The CL2151 implements PHY DES for physical security compliant to the OpenCable and DVB standards.

The CL2151 has a full complement of low-speed peripheral interface devices including those commonly used on commercial tuners such as SPL IDC (Inter-Device Communications), UART, and GPIO interfaces.

The SPARC processor internal to the CL2151 includes a DSP instruction set necessary for IP telephony applications. The CL2151 includes interfaces to an external uLAW, aLAW CODEC and appropriate SLIC chip sets. When combined with a MPEG source encoder/decoder, this solution delivers video telephony technology to the consumer STB.

C-CUBE SALES OFFICES

Manama IL
96 Donggani
Sta. 5422
Palmer Clark
Gardner, Colorado 80824
Phone: 303-426-5011
Fax: 1-303-426-7110

Spain
Stoner House, London Road
Crawley, West Sussex
United Kingdom BN11 0 2LJ
Phone: 44-1293-651100
Fax: 44-1293-651119

Beijing
Room 1101, Jade Palace Hotel
No. 76 Zhichun Road, Haidian
District
Beijing, China 100086
Phone: 86-10-626-38296
Fax: 86-10-626-38322

Chengdu
Room 1702
Chengdu Int'l Trade Centre
219 M Yu Jiang Street
Chengdu, China 610031
Phone: 86-28-673-5228
Fax: 86-28-631-2662

Hong Kong
1/F, Unit 305-302
Industrial Tech Centre
72 Tat Chee Ave, Kowloon Tong
Kowloon, Hong Kong
Phone: 852-2512-1789
Fax: 852-2511-6939

Japan
Palceppa Building 4F
2-2-19 Seiji-Yokohama
Rehaku-Ku, Yokohama
Kanagawa 242-0833, Japan
Phone: 81-45-474-7571
Fax: 81-45-474-7570

Korea
4F, 823-14 Yeoksam-dong
Kangnam-ku
Seoul 135-080, Korea
Phone: 82-2-561-9011
Fax: 82-2-561-9021

Shanghai
See website for new office address
and phone numbers.

Nanjing
Room 1715
No. 819 Nanjing W. Road
Shanghai 200040 PRC
Phone: 86-21-621-57630
Fax: 86-21-621-57629

Shenzhen
Unit A-P, 27th Floor
Int'l Trade Commercial Building
No. 3005 Nianchi Road
Shenzhen, China 518014
Phone: 86-755-519-5166
Fax: 86-755-519-5007

Taipei
A2, 13/F, No. 51, Sec. 3
Mingsheng E. Road
Taipei, Taiwan
Phone: 886-22-517-4939
Fax: 886-22-517-4937

In-Band Receiver	Standards Compliance	DVB-C, ITU-T J.83 Annexes A, B, and C
	A/D Converter	Internal 10-bit
Forward Interactive Channel	Symbol Rate	Variable from 1 — 7.2 Mbaud
	QAM Constellations	16, 32, 64, 128, 256 QAM (including DAVIC 256 QAM Msp)
Return Channel	IF Input Frequencies	7.2 MHz, 8.8 MHz, 36 MHz or 44 MHz IF inputs
	Output	Multiplexed transport stream output with forward channel
Processor and Control	Additional I/O	Point of Deployment (POD) MPEG out to POD, in from POD, and out to Demux
	Standards Compliance	DVB-RC, ITU-T J.83 Annexes A, B, and C DAVIC 1.2 part 8, section 7.8, DVS 167
Peripherals	A/D Converter	Internal 10-bit
	Symbol Rate	Variable from 0.772 — 7.2 Mbaud
Host MAC	QAM Constellations	16, 32, 64, 128, 256 QAM (including DAVIC 256 QAM Msp)
	QPSK	Differential Decoding
Physical	IF Input Frequencies	7.2 MHz, 8.8 MHz, 36 MHz or 44 MHz IF inputs
	Output	Multiplexed transport stream output with broadcast channel to Media Access Control units
Interface modules	Additional I/O	Point of Deployment (POD) RX bypass signals
	Standards Compliance	ITU-T J.112 Annexes A and B, DVB-RC/DAVIC DOCSIS 1.0 and DOCSIS 1.1 (Interim 01) DVS 167
Slave Mode	D/A Converter	Internal 10-bit
	RF Output	5 MHz to 65 MHz
Mixer Mode	Modulation	QPSK and 16 QAM
	DOCSIS 1.0 Features	Advanced modem pre-equalization of transmit signal Internal CMTS clock synchronization; no VCXO
Input Voltage	Additional Features	Programmable RS encoding (T=010, k=16/253) Programmable randomization Programmable unique word/preamble Internal slot timing and burst control Analog and digital gain control
	Additional I/O	Point of Deployment (POD) TX bypass signals
Packaging	Internal Microprocessor	117 MHz SPARC V8 processor for Media Access Control software
	Clock Generation	On-board PLL running from a single external crystal
SPARC Operating Frequency	AGC Output	Supports many Variable Gain Amplifier devices, including, but not limited to: Analog Devices AD8321 Lupint Technologies V4911 Analogics ARA05050 and ARA 1400 Maxim MAX3501
	Tuner Control	Implemented via SPI, IDC, or GPIO
SPARC Operating Frequency	Interface modules	Inter-Device Communications (IDC, Philips FC compatible interface; Mastermode only) On-chip UART Serial Peripheral Interface (SPI) PCM/SLIC Interface General Purpose I/O (GPIO)
	Standards Compliance	DOCSIS 1.0/1.1; DVB-RC/DAVIC; DAVIC DOB DVS 167; DVB Inband; DAVIC Inband
SPARC Operating Frequency	Slave Mode	PCI, Power PC, Coldfire, 5307, 68K, SH34
	Mixer Mode	Coldfire, 68K, Async Flash
SPARC Operating Frequency	Input Voltage	3.3V ± 5% (tolerates 5V inputs, except SDRAM), 1.8V
	Packaging	208-pin PQFP, 308-pin BGA
SPARC Operating Frequency	SPARC Operating Frequency	117 MHz or 88 MHz

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