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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	)	
	)	

REQUEST TO ACCEPT LATE-FILED COMMENTS

Zenith Electronics Corporation hereby requests the Federal Communications Commission to accept the attached late-filed Comments in the above-captioned proceeding.

Comments were due on May 16, however, unanticipated delays made it impossible to file these Comments before the Secretary's office had closed.

These Comments are being filed the following business day, and we believe no party will be prejudiced by this late submission. Accordingly, in the interest of

obtaining a full public record on these important issues, we respectfully request the Commission to accept these Comments.

Respectfully submitted,

ZENITH ELECTRONICS CORPORATION

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May 19, 1997

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COMMENTS OF

ZENITH ELECTRONICS CORPORATION

May 16, 1997

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COMMENTS OF

ZENITH ELECTRONICS CORPORATION

Zenith Electronics Corporation ("Zenith") hereby submits its comments in response to the Notice of Proposed Rulemaking regarding Implementation of Section 304 of the Telecommunications Act of 1996: Commercial Availability of Navigation Devices ("Notice"). Zenith is a major manufacturer of consumer electronics equipment, cable television decoders and communication modems. Indeed, Zenith has experience in all of the major product categories upon which the Notice seeks comments. Zenith's consumer electronics products -- primarily color television receivers and video cassette recorders -- are widely used by consumers. The Digital Television Standard recently adopted by the FCC employs the 8 VSB transmission system developed by Zenith engineers. Our analog cable television decoders are widely deployed in the cable television industry, and Zenith is in the process of developing a major order of digital television decoders for Americast Corporation to support its provision of digital video programming to consumers.

I. INTRODUCTION

In this proceeding, the Commission seeks comment on proposals to implement Section 629 of the Communications Act, entitled "Competitive Availability of Navigation Devices." Section 629, which was added to the Communications Act as part of the Telecommunications Act of 1996 (the "1996 Act"), instructs the Commission to:

> adopt regulations to assure the commercial availability, to consumers . . . of . . . equipment used . . . to access multichannel video programming and other services offered over multichannel video programming systems, from manufacturers, retailers, and other vendors not affiliated with any multichannel video programming distributor.

Rules assuring commercial availability are to be developed "in consultation with appropriate industry standard-setting organizations . . . ." In addition, the rules "shall not jeopardize security of . . . services offered over multichannel video programming systems, or impede the legal rights of a provider of such services to prevent theft of service."

The Commission has before it a difficult and complex task. The Notice seeks to identify ways to foster competition in the commercial availability of navigation devices ("set-top boxes") and allow consumers the benefits which the retail marketplace can bring to bear upon products. Those benefits include not only reduced costs but also technical innovations that add value to the consumer electronics equipment. At the same time, the rules to promote such availability must not jeopardize the system security of cable operators and content providers, nor facilitate, even inadvertently, the manufacture and use of equipment that is intended for unauthorized reception of services. Theft of service is a serious

problem that exists now in the cable industry, and it hampers the availability of desirable content because content owners fear the loss of their intellectual property. In an environment that uses digital technology, security may be easier to achieve, at least initially. However, in the long run, the threat to content providers' intellectual property may actually be greater because of the ability to make exact duplicates of content. This problem exists not only in cable, but in other services, such as satellite and wireless cable, which are also migrating to digital technology.

The Commission has used the unbundling and deregulation of telephone "customer premises equipment" (CPE) as a starting-point model for evaluating potential approaches to this issue. A central problem with this model, however, is that the cable and telephone industries represent fundamentally different network environments. The telephone network is a point-to-point switched system, connecting to a single user, whereas the typical cable system is a point-to-multipoint broadcast system, where the signal content is available everywhere in the system. In a broadcast environment, denial of access to unauthorized receivers requires a much greater security effort than that required by a switched system and the possibility of interference to the network and to other users is much greater. Complicating matters further, especially with respect to analog technology that prevails in currently deployed set-top boxes, is the lack of comprehensive industry standards. Instead of industry standards, cable equipment today employs brand-specific proprietary technologies that preclude the interoperability of set-top devices among different cable systems, even within adjacent franchises in a geographical area.

For analog technology, imposing a requirement that would create interoperability and portability, two attributes that are necessary for a viable retail marketplace, would be a difficult -- some would say impossible -- task. Existing analog technology mixes security and customer features and as a consequence the security technology is not easily separated. Such a task would require a long and expensive redesign process and the replacement of existing analog equipment. Given the anticipated deployment of digital technology within the cable industry, it does not appear to be economically feasible to create a retail market for analog set-top devices given the time frames required to achieve an industry standard, design product, tool, manufacture and deploy.

Accordingly, Zenith believes that the Commission should focus on emerging digital set-top technology. The advantages of concentrating on digital set-top devices are:

- Deployment is starting in 1997,
- Existing analog equipment would not be made obsolete by the Commission's action, and
- At least within the cable industry, there appears to be an emerging digital standard

This approach would allow an orderly transition from analog to digital technology with a minimum of economic impact to both consumers and providers. A longer-term advantage is the possibility of migrating the signal processing functions, excluding security, to the television receiver. Many of the signal processing functions in digital television receivers and digital set-top devices are common: tuning, video decompression processing, and digital audio. Signal transmission is accomplished by different, but not necessarily dissimilar techniques, thus dual

detection and low-level signal processing are technically feasible. Security could be provided by a replaceable security module provided by the cable operator and connected to the television receiver (or set-top device) through a common interface.

Such a migration scenario would offer advantages to both consumers and operators. Consumers would benefit by having set-top device and television receiver compatibility problems resolved, in addition to enjoying the economies from eliminating redundant costs because of common functionality in the television receiver and set-top device. Operators would benefit by removing a substantial economic burden from their operating and fixed costs by not having to amortize the much higher costs of digital set-top devices -- costs now borne by the consumer-- thus bringing the cable operator to competitive parity with satellite distribution, where customers purchase the hardware.

Creating such an environment requires the resolution of many problems, both technical and non-technical. The long and arduous process conducted by the cable and consumer electronics industries necessary to arrive at the proposed analog decoder interface standard is a vivid reminder that agreements in the public interest on such complex issues do not come easily. In the long term, if consumers are to exercise the right to interconnect competitively provided Customer Premises Equipment ("CPE") to any multichannel video programming system ("MPVD"), the associated industry participants and manufacturers must agree on industry-wide standards. The Commission should encourage industry-wide standards developed through voluntary standards processes. Such

standards are needed to allow the nationwide marketing of portable, interoperable devices to meet consumer demand for services and features in a competitive and innovative environment. To ensure that the CPE does no harm to the network, it may be advisable to register devices in a fashion similar to Part 68 of the Commission's rules regarding telephone CPE. We believe that this is the best approach for resolving the issues discussed in the Notice.

A. Statutory Objectives and Requirements

Zenith concurs with the Commission that consumers will benefit from having more choices among multiprogram video services arriving by a variety of distribution sources and from marketplace competition brought about by the commercial availability of set-top boxes. Based on our experience in both consumer electronics products and analog and digital set-top boxes, Zenith believes the Commission's efforts should be focused on digital set-top devices. Analog cable set-top device technology has a large installed base among the existing universe of 65 million cable subscribers, for which it will not be economically viable to replace the existing population of analog set-top devices with new consumer-owned analog set-top devices. One problem would be the enormous time required by the Commission and interested parties to arrive at a suitable set of standards and specifications, as evidenced by the effort to come to an agreement on equipment compatibility between the cable and consumer electronics industries that has stretched over five years. The effort to arrive at a similar agreement among different analog distribution sources would be ongoing

as the analog set-top devices were being replaced by digital set-top devices. Accordingly, we do not believe it will be sensible to do anything that will require replacement of existing analog units.

B. Current Distribution Models

Given the yet undelivered promise of switched video systems envisioned by telephone companies, the predominant model for distributing video services is still a broadcast model. This is a point-to-multipoint model and is the basis for terrestrial, cable, satellite and wireless cable distribution systems. These broadcast systems all use portions of the radio frequency spectrum, ranging as high as 12 GHz. These systems are subject to interference and to signal ingress that wired voice telephone systems do not experience, and because wired voice telephone systems are a switched point-to-point model, security is of less concern in the telephone environment, particularly regarding theft of service. Additionally, the telephone industry is mature and a well-developed set of technical standards makes the design of attachable devices relatively routine. Such a situation does not exist in the broadcast models.

C. Overview of Proposals

Zenith concurs with the Commission's premise that there is a right to attach CPE to the network, and that the issues of portability, interoperability and signal security are central to any successful implementation of commercial availability. Marketplace data is available and Zenith is willing to assist the Commission in

identifying sources of such data. While information concerning specific equipment, manufacturing costs and other associated data may be considered proprietary, both the Consumer Electronics Manufacturers Association ("CEMA") and the National Cable Television Association ("NCTA") should be of assistance in this regard.

Both CEMA and NCTA are involved in setting standards for a decoder interface to provide compatibility between television receivers and cable set-top devices pursuant to the requirements of the 1992 Act. That has not been an easy task, but a proposed standard has recently been submitted to the FCC. In 1995 the Advanced Television Systems Committee ("ATSC"), including representatives of the broadcast, cable, consumer electronics, computer and telephone industries, adopted a voluntary ATSC Digital Television Standard, most parts of which were then mandated in 1996 by the Commission as the Digital Television Standard for terrestrial broadcasts. In addition, the cable industry is currently creating a set of specifications for digital distribution under the auspices of the Society of Cable and Telecommunications Engineers ("SCTE"). Similar efforts are under way for a variety of other distribution systems. Although these are excellent examples of cooperative effort leading to voluntary industry standards, the number of groups involved also serves to give dimension to the potential difficulty of reaching a consensus. The Commission should strongly encourage standards developed through industry-supported open and voluntary standards-making processes. This will be needed to allow the nationwide marketing of portable, interoperable devices

to meet consumer demand for services and features in a competitive and innovative environment.

II. GENERAL COMMENTS

A. Introduction

For subscription-based video services, protection of system security is the highest priority. A breach of system security among a large population of commercially available devices using the same embedded security technology would be a major disaster. A breach of security in a distribution system which provides and owns the set-top devices is a serious problem. Despite existing prohibitions, signal theft occurs, and the legal pursuit of violators is difficult. However, the limited sources of obtaining boxes in the open market, as well as the ability of the system operator to change out devices, provides a considerable impediment to signal theft and a means of rapid, though expensive, recovery for the operator.

On the other hand, if consumers were to own the devices, security breaches would be a much more intractable problem. Consumer ownership of the set-top device presents a major barrier for local law enforcement, and potential consumer reaction to sudden set-top device obsolescence would constitute a major problem for any operator. Thus, it becomes important to isolate the ownership and control of the security function from the consumer and maintain the control with the distribution system.

B. Entities Covered by Section 629

The Commission in the Notice has broadened the scope of systems and equipment beyond cable systems. The inclusion of other distribution means within the Notice's coverage includes equipment used to access a wide range of video distribution systems. These include not only cable and satellite television, but also many other distribution systems. We believe this inclusion of such a broad range of services is necessary for the best possible understanding of the issues raised in the Notice. Including other services in the analysis will help delineate whether competitive parity exists among the various distributive services. In concurrence with the Commission's intent to limit regulatory burdens, we believe that comparisons of regulatory impact among the various equipment and associated services will help narrow the focus on the competitive environment that the Commission desires to foster for the consumer's benefit.

C. Scope of Equipment Covered

Zenith concurs with the Commission's recognition that television receivers, video cassette recorders, computer modems and basic telephones do not require any Commission action to assure competitive availability. Additionally, Zenith encourages the Commission to explore further the planned connection of personal computers to the network. Compaq, Intel and Microsoft have announced plans to include television tuning functionality in future personal computer models, and support only some of the digital video formats contained in the ATSC DTV Standard. Implicit in this approach is the necessity for a variety of functions,

including reception, display, tuning, security, storage, translation, and even return transmissions that may performed by these devices. These new capabilities require connection to a distributive network and the possibility of interaction with that network, some of which could be harmful to the network. Moreover, the technology involved with video decompression requires digital switching rates of approximately 70 MHz, which are within the broadcast spectrum used for broadcast television, and there could be a potential source of interference problems. Accordingly, we believe personal computers should be subject to the same scrutiny as other CPE devices.

D. Commercial Availability

Commercial availability implies widespread retail access for consumers, and by implication, *choice*. A relationship similar to the one between retailers and cellular telephone networks who cooperate in the sale of cellular telephones may be an acceptable model. The critical factor is that the retailer may utilize subsidies from only one cellular service provider, while offering competitive choices among cellular telephone instruments from different manufacturers.

E. Practical Availability - Portability and Interoperability

In a perfect world, the consumer would have to chose one device and that device, except for security, would be geographically portable and interoperable anywhere in the United States. In the long term this may be a reality. Architectures exist that have a replaceable Network Interface Module ("NIM") that

would be network or distribution system-specific. Taking a long-term view, a digital television receiver could have standard interfaces into which the proper NIM and security module would be attached.

Unfortunately, in the short and near term, consumers may have available to them devices with less universality. It is desirable that products available to consumers be interoperable within a system and be portable among different systems, especially within a given geographic area. Consider the sales viability of a retail set-top box that would not be portable if the consumer moved across the street into a different cable franchise. That situation exists today with currently available analog set-top boxes that are brand-specific because of proprietary technology.

For a truly competitive market, manufacturers must have access to the standards and technical specifications required for equipment interconnection. In order to ensure competitive markets, it may be necessary for the Commission to establish rules requiring timely disclosure of physical and logical interfaces, and technical specifications that are sufficiently detailed to permit manufacturers to design for interoperability with various transmission systems. Intellectual property rights must be recognized, but licensing should be available on a non-discriminatory basis.

F. Definition of Affiliate

Ownership or control should be the operative criterion. If a retailer is constrained to sell only devices of one manufacturer to the exclusion of others

because of arrangements between the manufacturer and system operator, the degree of competition may be questioned.

G. Security and Theft of Service

The Commission's comments in the Notice concerning signal theft should serve as a stark reminder of the magnitude of the problem. Current analog technology used in cable systems has frequently been breached, and the economic loss is estimated to be almost $5 billion annually. The combination of mature, less sophisticated technology, and the increasing sophistication of signal pirates have resulted in losses of such magnitude. Separating the security function in analog set-tops and making set-tops available at retail will only serve to make this breach of security situation worse. Any increase in signal theft results in a cost that consumers ultimately bear. The size of the installed set-top base, the lead-time to design, tool and manufacture new analog set-tops would also reduce any economic benefit to consumers in new rules applicable to analog devices.

The advent of digital video signal processing technology should improve the level of security available. At this time, we should recognize that the improved security may have a limited life span because of the sophisticated attacks it will face. The only long-term protection is to have replaceable and/or renewable security with a standardized interface. Timing is critical. In a transition to competitive markets for CPE, rules affecting a provider's hardware and equipment designs should be phased in so as to avoid obsolescence of service provider hardware. A joint CEMA and NCTA effort, the National Renewable Security

Standard ("NRSS") has resulted in an interim proposal for consideration among members. The NRSS permits two physical interfaces, however, there is a lack of consensus about the ability of the proposed standard to provide adequate security and to allow innovation for future services. If the Commission is to be successful in truly making set-top devices commercially available, the standardized interface must be a high priority and come to realization before the installed base of digital CPE devices, both set-top boxes and television receivers, grows to a point at which the economics of changing out non-compliant CPE precludes the implementation of the retail model.

III. CONCLUSION

Zenith applauds this effort by the Commission to meet its responsibilities to implement Section 629 and its interdependent public interest goals. First, the Commission has set in motion a process for maximization of consumer choice and flexibility resulting from the competitive availability of equipment such that "consumers are not forced to purchase or lease a specific, proprietary converter box, interactive device, or other equipment from the cable system or network operator." Second, commercial availability should stimulate and promote equipment innovation, with the expectation of lower costs ultimately to be borne by consumers. Third, the Commission is attempting to minimize governmental intrusion in the equipment design and installation process to the extent feasible. Fourth, the Commission is endeavoring to assure adequate protection of operators' networks from harm from any device used by consumers. Harm can be

technical or economic in nature. The breaching of security is always a potential threat to networks, and Zenith is encouraged by the Commission's diligence in searching for effective ways to minimize signal theft. Finally, Zenith encourages the Commission to explore more fully the potential impact of personal computers equipped with digital video and tuning capability when they are connected to video delivery networks.

For analog equipment to provide interoperability and portability, which are necessary for a viable marketplace, would be an extremely difficult task. Existing analog technology mixes security and customer features, and as a consequence, the security technology is not easily separated from other features and functions. Such a task would require a long and expensive process of redesign and the replacement of existing analog equipment. Consequently, Zenith urges the Commission to focus solely on emerging digital set-top technology.

Respectfully submitted,

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