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

FCC 92-468

FCC MAIL SECTION

In the Matter of	)	
	)	
	)	PP Docket No. 92-234
Inquiry into Encryption Technology	)	
for Satellite Cable Programming	)	

NOTICE OF INQUIRY

Adopted: October 8, 1992 **Released: November 4, 1992**

Comment Date: December 24, 1992
Reply Comment Date: January 8, 1993

By the Commission:

I. Introduction

1. By this Notice of Inquiry ("Notice"), the Commission undertakes its third examination of encryption technology for satellite cable programming.[1] The current proceeding responds to a request from members of Congress to "(1) review efforts to develop at least one additional source of video descrambling modules compatible with de facto industry standards for use of the C-band, and (2) review the feasibility of ensuring that all legal and compatible descrambling modules be eligible for authorization through the Direct Broadcast Satellite (DBS) Authorization Center."[2] In addition to

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[1] See Report in General Docket No. 86-336 ("Scrambling Report") 2 FCC Rcd. 1669 (1987); Second Report in General Docket No. 86-336 ("Second Scrambling Report") 3 FCC Rcd. 1202 (1988); Report in General Docket No. 89-78 ("Encryption Standards Report") 5 FCC Rcd. 2710 (1990).

[2] Letter of Edward J. Markey and C. Thomas McMillen, Members of Congress, to the Honorable Alfred Sikes, Chairman, Federal Communications Commission. July 6, 1992. See also Letters of the Honorable Alfred C. Sikes to the Honorable Edward J. Markey, Chairman, Subcommittee on Telecommunications and Finance, Committee on Energy and Commerce, House of Representatives and to the Honorable C. Thomas McMillen, U.S. House of Representatives. July 31, 1992.

exploring these issues, we take this opportunity to address related technological issues, such as the feasibility and utility of a standard decoder interface that would permit a single integrated receiver descrambler or IRD (a satellite receiver with a built-in decoder) to function with multiple encryption systems, perhaps by use of separate smart cards[3], and the implications of the apparent trend toward digital transmission of video, whether for ATV or compressed standard television signals, for encryption technology.[4]

2. In our 1990 encryption standards report, after declining to take additional regulatory measures, the Commission affirmed that "[D]evelopments with respect to encryption technology will certainly not be ignored by the Commission. Nor will we ignore evidence of abuse of their position by owners of any proprietary technology used in the encryption of satellite cable programming."[5] Moreover, we noted that, while a de facto industry encryption standard is in place, the possibility remains that "at some point, the consensus on encryption standards may break down in a way that imposes unacceptable burdens on consumers." This inquiry does not seek to reopen the issue of mandatory encryption standards. We continue to believe that competition in the home satellite dish (HSD) marketplace is likely to benefit consumers by providing an increasing range of choices both in program sources and in user-friendly reception equipment with sophisticated features and by holding down the prices of these goods and services. The public interest is well served when consumers have as wide as practicable a range of video service providers from which to choose. Moreover, the availability of reception equipment (including decoders for scrambled services) at reasonable prices is an important element in providing access for consumers to rival services. Consumers benefit from competition among rival distributors of video services. Our examination of relevant developments in encryption technology is designed to explore the possibility that, with the introduction of new technologies, the "consensus on encryption standards" might weaken, and to explore the possible consequences and industry responses to such a change. While we remain optimistic that the increasingly competitive private sector can navigate this transition successfully, we believe it is prudent to inform ourselves about the relevant technical and marketplace developments.

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[3] The standard decoder interface issue is also raised in a petition filed by the Consumer Satellite Coalition (CSC), which we address in this Notice. See Consumer Satellite Coalition, "Petition for Inquiry/Hearing For Removal of General Instrument Corporation's Decoder Monopoly Status In Home Satellite Dish Marketplace" ("CSC Petition") filed July 1, 1991.

[4] ATV is the acronym for advanced television, also sometimes referred to as high definition television (HDTV). NTSC stands for National Television Systems Committee and refers to the current broadcast television transmission standards in use in the United States.

[5] Encryption Standards Report at para. 73.

3. This inquiry is, in part, a consequence of the commitment outlined in the previous paragraph. We seek to build a comprehensive record on the subject of encryption technology, primarily with respect to satellite signals but, to the extent that it is relevant to the satellite area, we seek information about other encryption developments as well.[6] As a threshold question, we ask if the historical description in Section II is complete and accurate, and if it is not, we request supplementary information. If commenters should recommend any specific Commission regulatory actions with regard to the questions and issues detailed below, we urge them to include a careful discussion of the Commission's jurisdiction in this area.

II. Background

4. Previous Commission reports provide a comprehensive history of the scrambling of satellite cable programming services.[7] In 1975, Home Box Office (HBO) became the first video network to use satellite distribution. Currently, all of the major cable networks use satellite distribution, and 14 local commercial television broadcast signals also are retransmitted by satellite carriers.[8] These satellite feeds deliver programming to cable

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[6] We are not specifically requesting submission of any proprietary information. If any commenters choose to provide proprietary material, those submissions will be treated in accordance with relevant Commission rules. See 47 C.F.R. §§ 0.457(d), 459, and 461. See also 47 C.F.R. § 442.

[7] This section draws on the detailed description of the history of satellite signal scrambling in Scrambling Report, paras. 29-58, Second Scrambling Report, paras. 15-33, and Encryption Standards Report.

[8] See, e.g., "Satellite Orbit Extra," Satellite Orbit, September 1992. Along with the 14 scrambled commercial broadcast signals mentioned in the text, there is one scrambled PBS affiliate. In addition, there are three scrambled commercial broadcast signals and one scrambled PBS affiliate signal carried on a Canadian satellite. These are not generally available in the U.S.

The major commercial networks and PBS also use satellites to transmit their "network feeds." These include the feeds that the networks send to their affiliates, which contain the network's national programming and national commercials. The affiliates broadcast this material to viewers, sometimes immediately and sometimes not. The affiliates add local commercials and announcements before broadcast and may choose not to air portions of the network feed. The networks also transmit "backhaul feeds," which relay material such as news or sports events from a remote site to the network production center. Many of these feeds are scrambled, and the networks have plans to scramble the rest of them at some point. The Commission concluded that these are private transmissions not meant for the general public, and the networks do not offer them to dish owners or anyone

system headends, satellite master antenna systems, "wireless cable" systems, commercial establishments such as hotels and bars, and individual households.

5. In 1982, HBO sought proposals for an encryption or "scrambling" system for its signals. While the avowed initial purpose was to stop commercial theft of service, during the three and one-half year development period, HBO added the second goal of creating a consumer market for subscription satellite services. The technology chosen, known as Videocipher II (VC II), was originally developed by M/A Com, Inc. On January 15, 1986, HBO began scrambling its satellite feeds. Other major programmers followed suit. Currently, virtually all of the American satellite cable programmers have scrambled their signals, and all of those that have scrambled have chosen the VC II technology. General Instrument Corporation (GIC) purchased the Videocipher Division of M/A Com, Inc. in September 1986.[9]

6. By virtue of the patent rights that it acquired from M/A Com, Inc., GIC has had exclusive control of VC II technology up to now. GIC has also made a series of proprietary advances in VC II technology. While GIC has licensed a second source manufacturer of VC II modules (Channel Master), that firm must purchase certain key components from GIC, as well as pay royalties to GIC. Roughly two dozen firms are licensed to insert VC II modules into their IRDs. In sum, GIC effectively controls the supply of VC II decoder modules.

7. There are various other encryption technologies available, but programmers have overwhelmingly chosen the VC II. Our earlier examinations of the home satellite dish (HSD) programming market indicated that there are substantial public and private benefits from an encryption standard, although we have twice found that a mandatory government standard is not in the public interest.[10]

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else. See Scrambling Report, paras. 192-202. The networks use more secure encryption systems than the VC II for their network feeds (at correspondingly higher cost). Much syndicated programming also is distributed to stations via satellite.

[9] GIC has produced three separate generations of VC II decoder. The first version is known simply as Videocipher II (VC II). Next came the Videocipher II Plus (VC II Plus), which combined all of the security functions on a single very large scale integrated circuit chip and had other new features. See Encryption Standards Report, paras. 16-18. The Videocipher II Plus Renewable Security (VC II Plus RS) module uses the VC II Plus technology but also has a slot in the back for inserting a cartridge that could implement a security upgrade.

[10] See Scrambling Report, para. 223 and Encryption Standards Report, paras. 69-73.

8. Almost from the start, the VC II has been plagued by theft of service problems, commonly referred to as signal "piracy." While the encryption algorithm itself has remained secure, it turned out to be relatively easy to compromise the conditional access portion of the system, i.e., the authorization and reauthorization function. While an exact estimate of the extent of piracy is impossible, it is generally agreed that at least 50 or 60 percent of the original VC II decoders that received subscription services were doing so without authorization.[11] These "pirate boxes" are physically altered by insertion of additional chips that, along with authorization data furnished by the provider of the pirate equipment, allow the decoder to decode signals for which no payment has been made or authorization obtained. In response to this, GIC developed a new generation of decoder, the VC II Plus, and halted production of the VC II in 1990. The VC II Plus utilizes a single, very large scale integrated (VLSI) chip, which has apparently proved secure up to now.

9. In early 1992, GIC, in cooperation with several major programmers, announced a "free upgrade" plan for all legitimate VC II subscribers to participating programmers. After the upgrade program is completed, probably in late 1992, the programmers plan to "turn off" their VC II authorization data streams, thus pulling the plug on the VC II pirates. The separate VC II Plus authorization data stream will remain in place. The modules being used for the upgrade and being sold in new systems today are designated VC II Plus RS (renewable security). They have a slot in the back that could accommodate a "smart card" or cartridge which could be used for a security upgrade in the event that the VC II Plus technology becomes compromised. Such an upgrade presumably would be simpler and less expensive than the switchout of complete modules now taking place.

10. The wholesale price of VC II modules has increased significantly since they were first introduced, rising from $150 to around $330. While this increase has been accompanied by new features, including greater resistance to tampering, many in the industry believe that prices could and should be lower.[12] The advantages of maintaining a de facto standard such as the VC II have nonetheless kept programmers from adopting alternative technologies. Recently, however, the possibility of full competition in the production of VC II equipment has emerged. Titan Corporation acquired

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[11] See Encryption Standards Report, para. 39. As of the end of August 1992, roughly 3.2 million HSD systems had been sold, and there were 861,271 legally authorized VC II decoders of various generations. See "Satellite System Sales," Satellite Business News, Sept. 9, 1992, p. 1. The approximately 2.3 million HSD systems without authorized VC II decoders include those with pirate decoders, those with no decoder at all, and those that have been scrapped or replaced.

[12] See Bob Scherman, "Titan, Ergen, Ortolf Form Module Venture," Satellite Business News, July 1, 1992, pp. 1, 21 and "Congressmen Ask FCC to Study Titan Module," Satellite Business News, July 15, 1992, pp. 1, 22.

rights to the original VC II patents when it purchased a portion of M/A Com, Inc., but its purchase was subject to a five-year non-compete agreement with GIC. That agreement has now expired, and Titan has formed a joint venture to manufacture decoders.

11. In addition to manufacturing decoders, GIC operates a "DBS Authorization Center" for the benefit of the programmers that have chosen the VC II technology. Those programmers pay the full expenses of the DBS Center on a cost-sharing basis. In essence, the Center compiles and distributes an "authorization data stream," which includes information on the program services that each individual consumer decoder is authorized to receive. That data stream is delivered to the uplinks of all participating programmers, who insert it into their satellite feeds. Thus, each scrambled satellite feed includes the authorization information for all of the participating program channels. It appears, both from the nature of the authorization process and the fact that all programmers participate in the Center, that there are real economies of scale and scope in centralizing the authorization function.

III. Competition in the Provision of VC II Decoder Modules

12. As noted above, currently GIC controls, directly or indirectly, the production of VC II decoder modules. There is, however, at least the potential for some competition in the fabrication of modules between GIC and Channel Master, the second source manufacturer[13], and there are two dozen firms licensed to utilize the modules in IRDs. We seek comment on the significance of this competition and, in particular, on the extent to which there are differences in the price, terms, or conditions of sale of modules between GIC and Channel Master.

13. While the VC II Plus technology is proprietary to GIC, Titan Corporation, along with GIC, has rights to the initial VC II patents. While GIC's VC II system has been compromised and, indeed, is in the process of being phased out, the flaw has been in the conditional access portion of the technology rather than in the encryption algorithm itself.[14] For that reason, it is possible in principle for a secure version of the VC II to be developed.[15] Titan Corporation has formed Titan Satellite Systems Corp., a

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[13] See para. 6 above.

[14] See "Comments of General Instrument Corporation" in General Docket No. 89-78, filed June 19, 1989, pp. 11-14.

[15] We use the term "secure" advisedly. We assume that no encryption system is completely secure, particularly one designed to be inexpensive enough to be a mass market consumer product.

joint venture with Houston Satellite Systems, Inc. and Mr. Tom Ortolf, for the purpose of producing VC II modules.[16]

14. We wish to assess the potential benefits of "intra-VC II" competition.[17] How would it affect the price of decoder modules at the manufacturers' level and the price of IRDs at the retail level? What improvements, if any, in the security of encrypted satellite signals might competition bring, and how would it affect the cost of a security upgrade, should one become necessary?[18] To address these issues, we seek comment from Titan on its plans and prospects for competing with GIC in the supply of VC II modules. In particular, when does Titan expect to begin selling modules, and at what price? How is the price expected to change over time? While Titan's conditional access system will obviously be proprietary, what can Titan tell us about its security? If Titan plans to use a smart card, how much would a security upgrade cost? In this connection, we note that the current GIC consumer upgrade plan does not include commercial units. These units, located at the head-ends of cable systems and other commercial distributors of programming, still utilize the VC II technology, not the VC II Plus. We seek comment on the implications for the security of the GIC system of retaining the commercial VC II units. We also comment seek from GIC, from programmers, from program distributors, and others on whether and when the commercial VC II installed base should be upgraded. If such an upgrade were to happen, what effect, if any, would it have on the ability of Titan to compete with GIC in supplying decoder modules?

15. We are particularly interested in comments from equipment manufacturers on the viability and desirability of a non-GIC supplier of decoder modules. In what ways might such a supplier affect the design of

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[16] Houston Satellite Systems, Inc. (HTS) is a satellite equipment manufacturer commonly owned with Echosphere Corp., another equipment manufacturer and also a major equipment distributor.

[17] The Congressional letter requesting this inquiry notes the possibility that "a new source of descrambling equipment would stimulate competition and growth throughout the satellite dish industry, and greatly would enhance its ability to serve as a competitive distributor of television services." The letter also points out that competition may reduce costs. See Letter of Honorable Edward J. Markey and C. Thomas McMillen, Members of Congress, to the Honorable Alfred Sikes, Chairman, Federal Communications Commission. July 6, 1992.

[18] We reiterate that we are not soliciting submission of proprietary information. See note 6 above.

their IRDs[19] and what might the consequences be for the retail price of IRDs and HSD systems in general?[20] We also seek comment from programmers about intra-VC II competition. What effect might it have on the volume of HSD subscribers? Is there any downside risk from confusion or imperfect compatibility between GIC and non-GIC VC II decoders? What other considerations are relevant to a programmer's decision on whether to authorize non-GIC decoders? This last question encompasses the question of access to the GIC DBS Center.

IV. Access to the DBS Authorization Center

16. GIC operates a DBS Authorization Center in San Diego, California that all of the American satellite cable programmers use to authorize their HSD subscribers each month. The DBS Center receives information from programmers and their sales agents regarding subscribers to each service. The Center combines all of that information into an authorization data stream, which it then sends back to the uplink of all participating programmers for insertion into the programmers' satellite feeds. Thus, each satellite signal has embedded in it the authorization information for all subscribers and all participating channels. An individual HSD system needs to receive its authorization message on one channel to be authorized for all the channels to which the customer has subscribed. The decoders are reauthorized on a monthly basis, but the capacity of the authorization data stream is such that the reauthorization message for each individual decoder is sent many times per month, thus making it unlikely that a decoder will miss every reauthorization message because it was not turned on.

17. We understand that GIC claims to operate the DBS Center on a cost-sharing basis rather than for profit. The programmers and their authorized dealers share the cost of the DBS Center. It appears, then, that the DBS Center is operated on behalf of the programmers.

18. Because the mechanics of the Center's operation are complex, and because it is unclear where ultimate control of the DBS Center resides, we ask GIC, participating programmers, and any other relevant parties to describe how the DBS Center operates and explain who controls it. In particular, we are interested in the technical and contractual considerations that would need to be addressed if a programmer should wish to utilize the

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[19] For example, in a competitive situation, might GIC and/or a rival such as Titan offer its decoder in the form of a "chip set" rather than a fully fabricated module? Might this reduce IRD prices?

[20] Information relevant to this question includes cost data for GIC or Titan decoder modules, or cost data from other encryption systems including those in use overseas (e.g., the system used by BSkyB, the British DBS service).

DBS Center to authorize non-GIC Videocipher decoders.[21] What software standards or protocols, if any, might be needed to ensure that the DBS Center could accommodate non-GIC decoders? How would this affect the cost of operating the Center?[22] How would this affect the security of the Center and the integrity of the conditional access systems (of GIC and others) that the Center might support? Specifically, we seek comment on the following security issues. Will it be more difficult to maintain security if the Center serves multiple systems? Will it be possible to insulate the systems from one another, so that, if one system is compromised, others are not? In this connection, commenters should address not only the operation of the DBS Center itself but the compilation and distribution to programmer uplinks of the authorization data streams as well. Will serving multiple systems make it more difficult or expensive to respond to security breaches of a particular system?

19. We are under the impression that DBS Center users also must use GIC-licensed software to insert the authorization data stream into their satellite signals at their uplink sites. We ask commenters to verify this and to comment on whether the need to use this software or the terms under which it is licensed are potential impediments to intra-VC II competition. With respect to contractual terms, what would happen if a programmer announced its desire to authorize non-GIC decoders via the Center? Would GIC agree to such operations? Do programmers have the contractual right to insist on them? In paragraph 14 above, we asked programmers to comment on the desirability of intra-VC II competition. We now ask for their comments on the desirability of access by GIC rivals to the DBS Center.[23]

20. As indicated above, we presume that there are economies from centralizing the decoder authorization function. In order to explore this

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[21] We assume that, for decoders not utilizing VC II technology, there are no particular economies of joint authorization with VC II decoders, but seek comment on this as well.

[22] In addition to the impact on costs, we also seek comment on how the costs would be apportioned in the event that the Center is used to authorize decoders from more than one manufacturer. To the extent that GIC, the Center's operator, incurs or has incurred any expenses not compensated by programmers, we seek comment on whether enforced access of rivals to the Center might blunt incentives for improvements in the GIC DBS Center and/or discourage other entities from establishing such centers.

[23] In this regard, we note press reports that two programmers receive a royalty for every decoder module GIC sells. See "Titan, Ortolf, Ergen Eye Module Venture," Satellite Business News, June 3, 1992, pp. 1, 22. If this is true, what, if any, implications does it have for assessing "the feasibility of ensuring that all legal and compatible descrambling modules be eligible for authorization" through the DBS Center? See para. 1 above.

presumption, we ask for whatever non-proprietary information is available on the operating costs of the DBS Center. We also seek estimates of the cost of setting up an alternative authorization center, including comment on the fixed costs of an alternate center and whether, other things equal, it would cost programmers more to interact with two authorization centers rather than one. We note that Titan plans to set up its own authorization center (although it would apparently prefer to utilize the GIC center), that the PrimeStar medium power Ku band service has its own authorization center, and that Hughes plans to set up its own center to authorize subscribers to its planned DirecTV service.[24] We would welcome the benefit of their experience in planning or implementing an authorization center. We also seek information on any other relevant subscriber authorization systems, such as those in use in Europe.

V. Other Technological Issues

21. The Videocipher II technology is certainly not the only encryption technology available today, and, of course, many new techniques are likely to develop, particularly those that exploit the possiblities inherent in all-digital video transmissions. We seek comment on what other encryption technologies are available and/or already in use for satellite cable programming and on the extent to which any of these systems provide or could provide meaningful competition to the VC II.[25] In addition to these

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[24] See Bob Scherman, "Titan, Ergen, Ortolf Form Module Venture," Satellite Business News, July 1, 1992, pp. 1, 21, and "Thomson Wins DirecTV Hardware Contract," Satellite Business News, Feb. 12, 1992, pp. 1, 4.

[25] We note that PrimeStar currently is providing a medium power Ku band satellite service, with programming encrypted using a Scientific Atlanta system. Primestar apparently plans to introduce digital compression to its service at some point. Another Scientific Atlanta system, B-MAC, is now used for a number of individual pay-per-view events (such as championship boxing matches). Among the other firms offering encryption systems are Leitch and Oak-Orion. NBC uses the Leitch system for some of its network feeds, and ABC apparently plans to encrypt at least some network feeds with this system.

DecTec International Inc., a Canadian company, has developed a descrambling system that it claims is field programmable and can emulate a variety of encryption systems, including the VC II. GIC asserts that the DecTec system infringes on VC II patents and copyrights, and the two firms are involved in lawsuits in Canada. For information on DecTec, see "DecTec Claims Its Decoder Will Take 20% of GI's Market in First Year," Communications Daily, Jan. 14, 1991, p. 7; "New Controversies in Videocipher Land: BlackCipher Gets More Attention," Satellite Business News, Nov. 28, 1990, pp. 1, 26; Bob Scherman, "John Grayson: the Picture Descrambles," Satellite Business News, Jan. 23, 1991, pp. 1, 29, 30; and "SBCA Offers Membership to DecTec," Satellite Business News, May 20, 1992, pp. 1, 21.

existing systems, others are on the horizon. For example, Hughes and United States Satellite Broadcasting (USSB, a subsidiary of Hubbard Broadcasting) are planning to launch a DBS service in 1994. This service will make use of digital compression to transmit 128 or more NTSC signals from a single orbital slot.[26]

22. Additionally, the Commission is in the midst of a major effort to pick a standard for and facilitate the introduction of advanced television (ATV) service. Five of the six candidate systems are digital in nature. While the Commission's ATV proceeding aims to choose a terrestrial standard, that choice will likely affect the provision of service via other media and will undoubtedly affect the home reception and signal processing equipment that viewers will need.

23. Thus, the trend appears to be toward digital video transmissions, whether it be terrestrial ATV, DBS, or other satellite services. Among many advantages, digital transmission offers the possibility of more secure and cost-effective encryption of signals. However, the current VC II system is not digital compatible.[27] We seek comment on what options might be available to consumers as we move toward a world of digital video.

24. It is, of course, impossible to predict exactly which new services will be introduced, when they will be introduced, and when certain existing services would no longer be offered. Nevertheless, the possibilities outlined above strongly suggest that, at the minimum, there will be a significant transition period during which a wide range of incompatible satellite (and other) video services will be offered. We believe that it is important to gather information about technologies that will permit flexibility in the processing (including encryption and decryption) of the next generation of digital video services and technologies that might be available to smooth the transition from analog to digital transmissions.

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[26] There are nine DBS permittees. Press reports suggest that a venture of two of them, Hughes and USSB, may be the first to launch its service. See "Thomson Wins DirecTv Hardware Contract," Satellite Business News, Feb 12, 1992, pp. 1, 4, and Sean Anderson, "DBS Proponents Tell Dealers to Get Involved," Satellite Business News, Feb. 26, 1992, p. 12. See also Peter Lambert, "Hughes to Offer Cable Programmers Free DBS Ride," Broadcasting, April 27, 1992, p. 14 and "DBS Will Foster, Not Destroy, Localism, Says Hubbard," Broadcasting, June 8, 1992, p. 18. SkyPix, a proposed medium power Ku band compressed video service, has delayed its launch plans several times. See Bob Scherman, "SkyPix in Bankruptcy as Court Takes Control," Satellite Business News, Sept. 23, 1992, pp. 1, 22.

[27] Indeed, GIC's own Digicipher system, which is one of the contenders for the terrestrial ATV standard and can also be configured to transmit compressed standard television signals, is not compatible with the VC II.

25. We therefore seek comment on the extent to which future consumers will be faced with multiple, incompatible satellite and other video transmission technologies and on strategies for dealing with that situation. If the decoding/signal processing equipment is sufficiently inexpensive, then it might be viable for consumers simply to purchase multiple "decoders." Alternatively, there may be a place for a standard decoder interface, an idea proposed by a commenter in our original scrambling inquiry and revived two years ago by an editorial in a satellite industry trade publication.[28] In the satellite context, this would entail a satellite receiver with multiple "ports" or slots for cartridges or smart cards. Consumers would acquire cartridges for each encryption system they needed to decode programming. Each cartridge would be built to accommodate the standard decoder interface. We seek comment on the utility of this concept and on whether, if it is an efficient technique, market forces are likely to produce it.

26. As commenters address these issues, we urge them to bring to our attention any lessons for the future that they can draw from the HSD industry's experience with the VC II. However, we remind commenters that we have a separate proceeding open on ATV, and comments directed specifically to ATV should be submitted in that proceeding.

VI. Conclusions and Administrative Matters

27. Telecommunications technology is changing rapidly and the area of encryption for satellite cable programming is no exception. Substantial developments have occurred since our last report on encryption standards in 1990. We hope that this inquiry will yield important and useful information not only about competition in the provision of VC II decoder modules and the economics of the VC II authorization process, but also about possible alternative encryption technologies. Moreover, we hope that commenters will give us the benefit of their perspectives and analysis of the implications for encryption techniques of the trend toward digital transmission of video. Comments on how to deal with incompatible encryption systems, either during a technological transition period or over a longer period of time, are particularly welcome.

28. We note that the standard decoder interface proposal is raised in the CSC petition, and to the extent that this petition can be interpreted as requesting an inquiry (rather than a hearing) on this subject, we grant the petition. We deny the petition for a hearing. The petition also requests that the Commission review in detail the business practices of GIC. Some of the allegations in the CSC petition have been investigated and rejected by

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[28] See "Comments of United States Satellite Broadcasting Company, Inc. in Gen. Docket No. 86-336," filed Oct. 20, 1986, pp. 12-13. See also "FCC Should Mandate An Encryption Standard Interface," Satellite Business News, July 11, 1990, pp. 24-26.

the Commission already.[29] Other concerns raised have been rendered moot by marketplace developments during the past several years.[30] Moreover, we believe that the relevant public policy issues relating to encryption are addressed in this Notice. For these reasons, we deny CSC's petition, except as specified above, and treat it as an informal comment in the current proceeding.

29. Accordingly, IT IS ORDERED that the Petition for Inquiry/Hearing of the CSC is DENIED, except as specified above.

30. This Notice is issued pursuant to authority contained in Sections 4(i), 303(r), and 403 of the Communications Act of 1934, as amended. 47 U.S.C. 154(i), 303(r), and 403. Pursuant to applicable procedures set forth in Sections 1.415 and 1.419 of the Commission's Rules, 467 C.F.R. Sections 1.415 and 1.419, interested parties may file comments on or before December 24, 1992, and reply comments on or before January 8, 1993. To file formally in this proceeding, you must file an original and four copies of all comments, reply comments, and supporting comments. If you want each Commissioner to receive a personal copy of your comments, you must file an original plus nine copies. You should send comments and reply comments to Office of the Secretary, Federal Communications Commission, Washington, D.C. 20554. Comments and reply comments will be available for public inspection during regular business hours in the Federal Communications Commission Reference Center, room 239, Federal Communications Commission, 1919 M Street, N.W., Washington, D.C. 20554.

31. For further information concerning this proceeding, contact Jonathan D. Levy, Office of Plans and Policy, (202) 653-5940.

FEDERAL COMMUNICATIONS COMMISSION

Donna R. Searcy

Donna R. Searcy
Secretary

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29 Encryption Standards Report at paras. 61-68.

30 See, e.g., CSC Petition, pp. 7-8 (complaint that GIC did not use epoxy to block access to the decoder chips in circuit boards for certain VC II models that have not been produced for over two years).