

Table 2 (Cont.)

CHANNEL IDENTIFICATION PLAN

(By Frequency Assignments)

<u>Pix Carrier Frequency (MHz)</u>			<u>Channel Designation</u>	<u>Historical Reference</u>
<u>Std.</u>	<u>HRC</u>	<u>IRC</u>		
445.25	444.00	445.25	61	.
.
.
493.25	492.00	493.25	69	.
.
.
547.25	546.00	547.25	78	.
.
.
595.25	594.00	595.25	86	.
.
.
643.25	642.00	643.25	94	.

APPENDIX I: City of New York Report on Cable Compatiblity

**CABLE TELEVISION:
EQUIPMENT COMPATIBILITY HEARING**

**THE DEPARTMENT OF
TELECOMMUNICATIONS
AND ENERGY**

**WILLIAM F. SQUADRON
COMMISSIONER**

**NEW YORK CITY
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BACKGROUND AND INTRODUCTION

On May 10, 1991, the New York City Department of Telecommunications and Energy ("DTE") conducted a day-long hearing at City Hall to investigate problems in the compatibility of consumer electronics and cable television equipment. The hearing was precipitated by steadily mounting consumer frustration over the introduction of converter box technology and the scrambling of non-broadcast channels by the two Manhattan cable franchisees, Manhattan Cable TV and Paragon Cable. DTE invited representatives of New York City's cable operators, cable equipment manufacturers, and the television and video-cassette recorder ("VCR") industries to explore current and future means of mitigating the adverse impact on consumers of incompatible equipment.

The industry hearing followed two public hearings held in April 1991 by Manhattan Borough President Ruth Messinger in conjunction with DTE and the New York City Department of Consumer Affairs. At those hearings, dozens of cable TV subscribers, access producers, community group leaders and staff members of elected officials testified about a variety of cable concerns, including difficulties caused by the use of a converter box. The converter box complaints echoed those expressed by residents of Manhattan's Upper West Side at a hearing hosted by State Assemblyman Edward Sullivan the preceding month.

Richard Aurelio, President and Chief Executive Officer of the Time Warner NYC Cable Group, represented the Manhattan franchisees at the April hearings. Mr. Aurelio stated that the companies were introducing signal scrambling and converter boxes to combat theft of service and facilitate the accessibility of pay-per-view programming for consumers. He noted several other advantages of the converter box technology, including improved reception, and claimed that MCTV and Paragon were doing everything in their power to combat the incompatibility-related problems.

Following these hearings, and in light of the numerous letters and telephone complaints received by DTE's Consumer Services Division on the converter box issue, DTE decided to convene a hearing at which expert witnesses could explain the incompatibility issues and offer suggestions to mitigate or eliminate the difficulties. In addition, DTE sought to explore ways of avoiding the recurrence of such problems, and whether such long-term approaches should be pursued at the federal level.

WITNESSES'

DTE invited Councilwoman Carol Greitzer, who chairs the Consumer Affairs Committee of the City Council and has been very active on cable consumer matters, to lead off the hearing and

/ The testimony provided at the hearing is summarized in this report. A complete videotape of the hearing is available from the Department of Telecommunications and Energy.

provide an overview. Panels of expert witnesses representing the City's cable franchisees, cable equipment manufacturers, and consumer electronics manufacturers followed Councilwoman Greitzer.

DTE Commissioner Bill Squadron opened the hearing by reading a letter from Roy Stewart, Chief of the Mass Media Bureau of the Federal Communications Commission. Mr. Stewart had written in response to an inquiry regarding equipment compatibility issues and an invitation to testify sent to the FCC. Mr. Stewart's letter stated that issues surrounding compatibility among components of television reception equipment had not, to date, been formally raised before the Commission. The Mass Media Bureau would be interested, however, in further details regarding the City's proposal to develop an inter-industry working group to address long-term compatibility questions.

Commissioner Squadron's opening statement also briefly described the concerns expressed by consumers to the Department of Telecommunications & Energy. Consumers have objected to the mandatory use of the addressable converter box, claiming that it eliminates many of the features on their recently-purchased televisions and VCRs -- features like on-screen programming that

induced them to purchase state-of-the-art equipment. The introduction of converter boxes and signal scrambling** will make it extremely complicated (and in some cases, impossible) for a typical viewer with a single television and a single VCR to watch one program while taping another except by ordering -- and paying monthly charges for -- two separate converter boxes.

Councilwoman Greitzer

Councilwoman Carol Greitzer stressed that she was not only a Manhattan Cable TV subscriber but that she also represents numerous cable-customer constituents who have "expressed their unhappiness to me." Councilwoman Greitzer touched on the service changes being introduced by MCTV and Paragon Cable. She contended that the changes are disruptive, unnecessary, and, above all, will result in increased costs to subscribers above the rate increases that went into effect several months earlier.

The Councilwoman's statement also addressed cable-ready television sets with their own remote controls that are currently

**/ Currently, the so-called premium services such as Home Box Office or Showtime are scrambled, and subscribers who purchase at least one premium service already have converter boxes in place. In the Paragon area, for example, approximately half of the company's 170,000 customers subscribe to a premium service. Both Manhattan companies plan, however, to scramble all but the Basic Service channels at the end of 1992, when the system upgrades are completed. The only unscrambled signals at that time will be the over-the-air broadcast channels, the access channels, and C-SPAN; such cable networks as CNN, MTV, and ESPN that are not currently scrambled will be, requiring the converter box for reception. Virtually all cable subscribers in Manhattan will therefore require a converter by 1993.

in use by many cable subscribers. She stated that, with the change in service, all subscribers will be forced to have at least one converter box, plus -- in many cases -- pay for a new remote control device provided by the cable companies.

Regarding the theft of service problem, Councilwoman Greitzer suggested that the cable companies should employ or develop alternative means of dealing with this matter that do not involve penalizing the consumer. According to a survey conducted by her office in Manhattan, many cable customers only acquired cable service to improve reception of over-the-air broadcast channels.

Cable Operators

The cable company panel consisted of Richard Aurelio, President of the Time Warner NYC Cable Group, which has complete or partial ownership of 6 of the 9 New York City franchisees; Dr. Walt Ciciora, Vice President of Technology for American Television Communications Corporation ("ATC") & Time Warner NYC Cable Group; Sheila Mahony, Vice President, Cablevision Systems Corporation (holder of 2 City cable franchises); and Wilt Hildebrand, Vice President of Engineering for Cablevision Systems.

This panel disagreed with much of Councilwoman Greitzer's testimony, denying that the channel scrambling, converter boxes, and remote control charges were driven by the cable companies' desire to raise revenue at the consumer's expense. Mr. Aurelio

stated that converter box technology was essential to reduce the high incidence of theft in Manhattan, which Time Warner random audits place at approximately twenty percent. He noted that other consumers were unfairly subsidizing this theft and that the City was being improperly deprived of franchise fees. He asserted that converter boxes would improve reception, in part by eliminating the reception problems caused by people in apartment buildings unlawfully tapping into the cable line. Other benefits, according to Mr. Aurelio, are the increased access to pay-per-view programming and the company's ability to change service tiers without the inconvenience to the consumer of a home visit.

In response to questions concerning Time Warner's efforts to educate consumers on the operation of VCRs and the new converter box, Mr. Aurelio stated that the Time Warner companies air an instructional tape, on an ongoing basis, which explains how to operate the VCR with the converter. In addition, company technicians often advise subscribers on VCR usage when installing the converter box.

Dr. Walter Ciciora likened the technological complexities and resulting consumer frustration occurring in the cable industry today to the introduction of other new technologies that required time and industry adjustment to gain widespread consumer acceptance and comfort. Dr. Ciciora observed that Time Warner is developing electronic programs which make the use of cable

equipment and VCRs easier and more consumer-friendly.

Sheila Mahony discussed the transition period during which consumers become comfortable, over time, with new electronic equipment. She stated that Cablevision had not received many complaints from its customers in the Bronx or Brooklyn regarding the impact of the company's converter box on their television sets and VCRs.

Wilt Hildebrand expanded on the experience that Cablevision has had with its customers in Brooklyn and the Bronx. He described how Cablevision technicians explain to the consumer how to use the converter box and VCR at the time of installation. His testimony -- and the evidence overall -- indicated that customers in other boroughs have not objected to the converter box and its adverse consequences nearly as much as Manhattan subscribers who have had cable for more than a decade without a converter. Outside Manhattan, subscribers have nothing with which to compare their converter-based cable service.

Mr. Aurelio addressed concerns regarding the information provided to subscribers about the introduction of the converter, particularly the two-dollar monthly charge for an optional remote control device with basic service. He stated that Time Warner technicians were directed to disclose all charges fully, including the twenty-five dollar deposit per converter box in Paragon's territory. Mr. Aurelio said that the handbook contained all the information a consumer needs concerning equipment use and pricing, but that consumers do not want to hear

about the technology because it is too complex. He explained that most people do not want to contend with such complexities. Mr. Aurelio testified that he did not believe the consumer dissatisfaction with the converter box to be as extensive as Councilwoman Greitzer suggested, noting that "only eleven" of the witnesses at the April hearings in Manhattan addressed the incompatibility issue.

In response to a suggestion that Time Warner assist consumers with their equipment during the transition of the upgrade by offering additional service calls free of charge, Mr. Aurelio said he would review the matter.

All witnesses discussed the need to scramble all non-broadcast channels to combat theft of service. Ms. Mahony and Mr. Hildebrand stated that theft of service is not as pervasive in Cablevision's franchise areas as it appears to be in Manhattan (where converters and scrambling are only now being introduced), but said that Cablevision does have a special security group pursuing the thefts that do occur. The cable industry anticipates that descrambling will be built into TV/VCR systems within 20 years.

Cable Equipment Manufacturers

A four-member panel of television hardware manufacturers testified at the hearing. The panel consisted of Dan Moloney, Director of Marketing for Jerrold Division, General Instrument Corp.; Gary Trimm, Vice President for Subscriber Products,

Scientific Atlanta, Inc.; Richard Annibaldi, Product Development Manager, Pioneer Communications of America, Inc.; and Vito Brugliera, President of Marketing & Product Marketing-Consumer Electronics, Zenith Electronics Cable Products Division.

The first witness, Dan Moloney, addressed the technological advances in the consumer electronics industry and the necessity to integrate products with existing capabilities. Mr. Moloney said that there will be no single solution to this problem but that there is an ongoing dialogue between the various arms of the industry which will benefit consumers.

Mr. Richard Annibaldi testified about the advantages of the addressable converter. He said that the addressable converter/descrambler is the most cost-effective solution for the security/flexibility dilemma. As program options continue to grow, subscribers make frequent changes in their programming mix. Without a converter box, these changes require the cable operator to send out a technician to make the necessary adjustments to the subscriber's cable equipment. This arrangement is costly to the operator, and ultimately to the subscriber as the cost is passed along. It also causes the inconvenience of scheduling appointments for entry to the subscriber's premises.

Mr. Annibaldi did note, however, that scrambling does place some restrictions on the subscriber's use of cable signals. Because only one cable channel can be selected at a time by a single converter/descrambler, it is not possible to view one

scrambled channel while simultaneously using a VCR to tape another scrambled channel. Mr. Annibaldi stated that use of an antenna and the appropriate A/B switch can at least permit viewing non-scrambled, over-the-air broadcast stations, for example, while taping a cable channel.

Mr. Annibaldi claimed that state-of-the-art addressable converter/descramblers have improved considerably, and now offer a variety of consumer features which enhance their use, including:

- o Wireless Remote Control
- o Volume control (including muting)
- o VCR Timers (for multiple programs)
- o Favorite Channel Recall
- o Last Channel Recall
- o Impulse Pay Per View
- o Universal Remote Controls
- o VCR Programming Aids

Mr. Vito Brugliera noted that his company, Zenith, both manufactures television sets and supplies addressable converter systems to the cable industry. He testified that the dramatic advance of technology has outstripped the ability of the market to replace consumer electronic products. Statistics show that 92 million households contain 170 million TV receivers and 70 million VCRs. Moreover, Zenith estimates that more than 70% of its color TVs built since 1961 are still in service, although

these older sets may no longer be the primary TVs in the home.

Mr. Brugliera contended that cable operators and equipment manufacturers "devote considerable resources to develop economical technologies that will serve the cable customer and provide the entertainment, educational and informational benefits that cable is able to offer. In any advanced cable system there are three key technology concepts that the cable operator must have to provide those benefits as efficiently as possible: access, control and security." Mr. Brugliera elaborated on these three concepts:

Access. "Access" allows cable subscribers to tune the channels on a cable system. Even though there exist millions of "cable compatible" televisions in homes nationwide, there are also millions of sets, including early cable compatible models, that are not capable of tuning all of the cable channels used by particular cable systems. The cable operator must provide some means for the subscriber to receive all the cable channels on television receivers with limited tuning capability. According to Mr. Brugliera, the set-top converter box is the most efficient means of accomplishing this objective for older receivers.

Control. With respect to control, Mr. Brugliera echoed the testimony of Mr. Annibaldi regarding the consumer's enhanced ability to upgrade or downgrade programming services with the converter box. According to Mr. Brugliera, "this addressable technology becomes more important as the choice of programming expands...."

Security. Mr. Brugliera's third cable technology concept, security, involves cable signal theft. In the menu offered by cable operators, subscribers may decline certain programming options because of cost or content. Cable operators scramble such signals so that these subscribers are not able to view them. Unfortunately, piracy of these scrambled signals results in a loss of revenue to the cable company, which, according to Mr. Brugliera, ultimately results in honest subscribers subsidizing the pirates. Each year, cable operators nationwide lose an estimated \$3 billion in revenue from theft of service. Mr. Brugliera stated that this loss translates into a \$150 million lost to municipalities in franchise fees.

Mr. Brugliera testified that the battle between cable pirates and the cable industry has raged for years, with the industry sharpening its security techniques as the thieves become more sophisticated. Cable technology experts consider the converter box to be the state-of-the-art means of combatting theft because there is no unscrambled signal outside the home for

a cable pirate to steal. Mr. Brugliera contended that "there is little question that the most cost efficient way to accomplish access, control and security is the addressable set-top converter." The panel acknowledged, however, that black-market converter boxes have already begun to appear and represent the next challenge for the industry. Even the converter box technology, therefore, is not pirate-proof.

Mr. Brugliera also described a variety of products that cable hardware manufacturers have developed to satisfy specific needs and interests of consumers.

The "universal" remote control device consolidates the features of several remotes into a single device, eliminating the need for separate remotes for the converter box, television set and VCR. A common complaint when addressable technology is introduced is the cumbersome aspects of the technology. The panel acknowledged that universal remotes were not currently in widespread use due to the cost of purchasing an additional remote to replace capabilities, however cumbersome, that the consumer already owns, and to the complexity of some of the universal remotes.

In response to a question whether standardization of remote technology would benefit consumers, Mr. Brugliera said that many electronic manufacturers had remote compatibility within their own product line and standardization would interfere with this feature. Additionally, standardization would lock the industry

into a specific technology. He pointed out that the technology available in today's remotes is very different than the technology used just a decade ago.

The A/B switch can be used to regain some of the features lost when a converter box is used. Mr. Brugliera explained that the A/B switch is an outlet on the back of the converter box which routes signals between the drop and either the converter box or the television set. It operates manually. If the converter box is switched off the signal goes directly to the television set. If the signal is unscrambled the consumer can use all the features of the television set. If the signal is scrambled, the converter box becomes necessary.

The VCR/converter interface creates several complexities:

- Unscrambled channels can be viewed and recorded simultaneously.
- Recording a scrambled channel limits viewing to that scrambled channel. An unscrambled channel can be viewed with the adding of a splitter, although Mr. Brugliera conceded that the typical consumer would require explicit instructions.
- Taping one scrambled channel while viewing a second scrambled channel requires two converter boxes.

Another example cited by Brugliera of the cable equipment manufacturing industry's response to consumer needs was its anticipation of the issue of programming VCRs with a cable converter. The "TAC-timer" is a Zenith remote control device

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with a built-in clock to automatically turn on the Zenith converter and change its tuning to capture the programs for recording. Although the TAC-timer was originally targeted for existing cable subscribers using Zenith addressable converters built before the rapid growth of VCRs, this feature is now built into most addressable converters.

Mr. Brugliera also discussed the Multiport technology. Multiport is a television set feature that consists of an add-on decoder used with specially designed TVs. The Multiport connector sits on the back of the television and functions like a converter box receiving and decoding designated scrambled channels. The Cable Products Division of Zenith has been working on a Multiport interface standard through the joint EIA/NCTA Committee, discussed below.

In looking towards the future, Mr. Brugliera visualizes similar efforts by industry to try to match rapidly advancing technologies with consumer needs. With television and cable equipment technology exhibiting quantum leaps in design, Mr. Brugliera said it has taken time -- and will continue to -- for both industries to keep pace with each other in responding to customer needs and offering new benefits.

Mr. Brugliera stated that while the introduction of the next five years of HDTV and digital signals will offer the opportunity to address some equipment problems, "old products stick around,"

"and with 20 million TVs sold annually and 170 million households - it is going to take a long time."

The panel addressed the possibility that interdiction technology would provide a means by which cable operators could set -- and change -- the mix of a subscriber's desired channels from the operator's headend without system-wide signal scrambling, thereby eliminating the need for a converter box and allowing consumers to make use of the advanced functions of their television sets. The concept involves a per-channel interfering signal sent remotely to a tap location (with an installed interdiction device) outside the subscriber's home. Addressable oscillators in the interdiction devices transmit the interfering signals to a single channel or groups of channels on the consumer's television.

In response to questions about the suitability of this technology for urban areas, the panel stated that interdiction was feasible but significantly more problematic for subscribers in large apartment buildings. Because each interdiction unit is sizable and requires its own power, locating enough appropriate and cost-effective space to introduce interdiction in an urban setting presents substantial difficulties.

Interdiction, however, is not a technology that deals effectively with theft of service because all signals are distributed to the tap in-the-clear, and all purchased signals are sent clear along the subscriber drops. The signals,

therefore, could be easily intercepted at the tap location or from the subscriber drop line. There is no effective way, at this time, to detect these interceptions.

Additionally, interdiction does not currently provide for two-way addressability. An additional piece of equipment would have to be introduced in the home to order pay-per-view or home shopping directly, thereby defeating some of the benefits of interdiction. Mr. Moloney also observed that the cost/benefits analysis of interdiction would be affected by advancing technology. He pointed to the pending introduction of a one gigahertz system in Queens, which with present technology would make interdiction very costly.

Consumer Electronics Industry

The third and last panel, representing manufacturers of consumer electronics, was led by David Poisson, Executive Director of Government Affairs/Deputy General Counsel for the Consumer Electronics Group of the Electronics Industries Association ("EIA"). Tom Mock, EIA Director of Engineering, accompanied Mr. Poisson.

EIA has been the leading industry trade group for more than sixty-seven years. Its members manufacture, sell, and service a wide variety of devices, including radios, televisions, videocassette recorders, video cameras, and compact disc players.

The organization sponsors forums for the development of industry standards and participates in the formation of public policy at all levels of government.

Since 1982, representatives from the EIA and the National Cable Television Association ("NCTA") have participated in a Joint Engineering Committee ("Joint Committee") to explore solutions to some of the subscriber interface issues described at the hearing. Mr. Poisson observed that the Joint Committee has been working on the increasing complexity of interconnection and interoperation between and among the various services and products. While the Joint Committee has made progress in certain areas, Mr. Poisson stated that additional support from the federal government for an inter-industry working group could help address equipment compatibility issues.

Mr. Poisson also testified that manufacturers of VCRs and televisions are committed to customer satisfaction, and that problems related to cable service are not attributable to the actions of the consumer electronics industry. He expressed concern that the cable industry was unfairly trying to shift the blame for these difficulties to electronics manufacturers.

Mr. Poisson pointed to the conflicting objectives of the consumer electronic and the cable industries. Mr. Poisson said that while the consumer electronics industry works to provide the widest range of capabilities to consumers and facilitate the use of cable, the cable industry seeks to promote its own premium

services. One way this is done is by getting two way addressable converters into every home, even when a consumer believes he will never make use of this option. If the equipment is already in place, Mr. Poisson said, the cable industry counts on the impulse buy.

Mr. Mock also said that while technological features can be designed, the decision to implement a new feature is a marketing one. He pointed out that the Multiport technology seemed promising from a technical standpoint, but that cable operators had been reluctant to test the feature.

Mr. Poisson said that policy concerns between industries, is a decision for the Congress. He stressed, however, that new technologies that may now be unforeseeable will have a great effect on these issues. Mr. Mock said that the industry was too diverse for a single standard.

CONCLUSIONS AND RECOMMENDATIONS

The testimony tended to address two distinct topics: 1) problems associated with the introduction of converter box technology in Manhattan; and 2) long-term means of dealing with equipment compatibility among the cable and consumer electronics industries.

Converter Box Technology and Signal Scrambling

Based on the evidence presented at the hearing, the Department of Telecommunications and Energy finds that the use of converter boxes to descramble signals represents state-of-the-art

technology in the cable industry. It also represents an important and necessary measure to combat extensive theft of cable service in Manhattan. Other means of fighting theft, including the interdiction technology being tested in several locations around the country, do not yet compare with signal encoding and converter boxes. The Manhattan systems will, after full deployment, conform technologically to the delivery of cable service in the four other New York City boroughs.

The signal scrambling and converter box technology will protect law-abiding cable consumers from the financial and operational harm inflicted by cable pirates. More specifically, cable subscribers will not experience reception difficulties caused by thieves tapping into lines to appropriate unscrambled channels and will not subsidize the unlawful reception of cable service. Moreover, reducing theft of service will assure the level of revenue properly due New York City from cable television franchise fees.

Converter box technology also offers consumers the convenience of upgrading or downgrading their service options (such as HBO or Showtime) without having to wait for a technician to make a home visit. In addition, it will facilitate the ordering of pay-per-view programs for subscribers interested in that capability.

Notwithstanding these significant benefits, it is apparent that the introduction of signal scrambling and converter boxes causes certain adverse consequences for subscribers. For example, the converter box nullifies some features on advanced television receivers such as on-screen programming. To retain remote control capability, it requires the use of its own remote device that may not have the full range of options provided by the television set's remote; and the cable companies have imposed a two-dollar monthly charge for the remote control device for Basic Service customers. With respect to video-cassette recorders, subscribers will have to obtain an A/B switch to maintain existing ability to tape one program while watching another, and taping a scrambled channel while watching another scrambled channel will become impossible.

We find that the efforts of Manhattan Cable and Paragon to smooth the transition to the new configuration and to mitigate the adverse consequences for consumers have been inadequate. While several witnesses noted that Manhattan cable subscribers will simply be receiving the same system that subscribers in other boroughs have had for years, it is significant that Manhattan subscribers -- unlike those in other boroughs -- received cable service without converter boxes and scrambling for over a decade. While the system modification reflects state-of-the-art technology and carries the many benefits described above, the fact that many consumers may be experiencing what -- to them