

## PROGRESS IN CONSUMER ELECTRONICS STANDARDS

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### INTRODUCTION

The consumer electronics interface with cable has been a growing problem for the past decade. The principal cause of the difficulties is that the two industries developed independently without much communication. Initially, that wasn't a big deal since both cable systems and television receivers were rather simple from a technological perspective. However, as technology opened more and more options, incompatible choices were made in the two industries. Neither industry took a homogeneous stand. The various television receiver manufacturers made different choices and the large number of cable systems chose different methods of implementation. The cable subscriber, who is simultaneously a consumer electronics product buyer became caught in the middle.

Five years ago, the Electronics Industries Association, EIA, and the NCTA, Engineering Committee formed a task force to tackle these kinds of problems. The EIA/NCTA Joint Engineering Committee was born. The committee itself tackles some problems and delegates others to subgroups of specialists.

There are two primary purposes for the committee's existence. The first, and most important, is to serve as a forum for the exchange of technical information between the two industries. Mutual education will result in design choices which are more likely to satisfy the cable subscriber and the consumer electronics customer. The second purpose is to create technical standards which codify the requirements for compatibility between cable and consumer electronics technology.

There are three levels of standards. The most mature standards are in the "RS" series. RS means "recommended standard". Perhaps the most familiar example of this series is the RS232 standard used with computers and data communications devices. A step along the way to "RS" is "IS" standing for "interim standard". An IS standard is issued on a trial basis for a

year or two for manufactures to attempt designs in order to more fully understand the consequences of the standard's details. After the trial period, the standard is amended to include learning from the past year and voted upon by the EIA for promotion to RS status. The least mature phase in the development of a standard is the "Recommended Practice". It is intended to indicate a direction for manufacturers to choose in an area where there may be many reasonable approaches but industry interest does not support the development of a full standard. Recommended practices are not as thoroughly debated or tested as IS or RS series documents.

It is important to realize that these standards are voluntary. Neither the NCTA nor the EIA have enforcement powers. Adherence to the standards depends on the good faith of the companies involved.

### IS-6: CHANNELIZATION STANDARD

The channelization standard is a case study of the process of standards creation. Engineers from the two industries met and educated each other on the various methods used to allocated frequencies in the cable spectrum to channel designations. A debate ensued over the pros and cons of the various methods. Of course, individuals wished to preserve the methods they used in the past to minimize changes required of them. Far sighted participants tried to accommodate future needs. After much debate a compromise approach was found. Some questions were deferred until more experience was gathered. The interim standard was issued in May of 1983. Manufacturers then evolved their product designs towards compliance with IS-6.

In late 1986, the committee took up the issue of finalizing IS-6 into a proposal to the EIA for promotion to RS status. The principal issues remaining were the channelization of the FM band, the order for expanding channel capacity, and the method of counting channel capacity. The FM issue centers on the

fact that receivers generally have traps (frequency selective filters) in the FM band to prevent interference with Channel 6 reception when strong FM signals exist in the reception area. This trapping practice is essential for off-air performance and therefore cable operators must use channels in the FM band accordingly. TV receiver manufacturers will likely strive to develop switchable filters for future product. While not technically practical at present, the need has been highlighted and the consumer electronics industry is now aware.

The order in which channels are added when capacity is expanded and a fair method of indicating capacity to the consumer have been agreed upon.

Before the channelization standard, cable companies used numbers and letters to designate channels in a variety of ways. There simply were a number of equally logical ways of doing this and no mechanism to coordinate between those making the choices. A serious consequence of this situation is that it became impossible for consumer electronics product manufacturers to make receivers which complied to multiple channelization methods. Now, with IS-6, cable practice and consumer electronics design can converge over time to the benefit of the subscriber.

#### IS-15: DECODER INTERFACE STANDARD

Perhaps the standard which has the most potential to solve consumer electronics interface problems is the IS-15 Decoder Interface Standard which is also known as the EIA Multiport. The standard is embodied as a 20 pin plug on the back of a television receiver or VCR which accepts a set-back descrambler. It has been adopted and endorsed at the IS level by both the EIA and the NCTA.

The principal advantage of the Multiport is that it makes a truly cable ready receiver possible in a scrambled environment. Because descrambling is accomplished after the receiver's tuner, the consumer electronics product can be directly connected to cable. The subscriber regains use of his remote control. In the case of a VCR, the timer again becomes useful. It can again control channel selection and turn the VCR on and off. An important secondary advantage is a significant reduction in cost to the cable operator. Set-back descramblers will be 40% to 60% the cost of set-top units. It becomes practical to provide two units, one for the TV and another for the VCR. For the first time, it's possible to watch one scrambled channel while recording a different scrambled channel at an affordable price.

A practical limitation of the EIA Multiport is that it requires the subscriber to purchase a new Multiport equipped TV receiver or VCR. This won't happen overnight. Unfortunately, TV's last too long. The typical life is twelve to fourteen years. New receivers are bought every seven years with the old unit put in the basement or donated to one of the kids who grew up with it. Significant penetration will take time. However, the subscriber who feels he needs a solution can contribute to it by making a purchase. Even that was unavailable just a few short years ago.

The situation is dramatically different with VCR's. Since they wear out, VCR's are replaced every three or four years by heavy users. The rotating heads are a critical mechanical element in an otherwise electronic system. They clog and wear causing expensive repair bills. In many cases, the cost of repair rivals the cost of a new unit. Since the purchase of a VCR more than doubles the trouble with the consumer electronics interface, it is particularly appealing to find that the EIA Multiport can bring relief when taken as an option on a new VCR.

First TV's and VCR's with Multiport are expected on the market this year. Descrambler vendors have promised evaluation samples in the beginning of the third quarter of this year with volume delivery a few months later. The NCTA Engineering Committee has formed a subcommittee under Joe Van Loan of Viacom to promote and stimulate the Multiport among the MSO's. While there is still a lot of work to be done, progress on this important standard is heartening.

#### IS-23: RF-CABLE INTERFACE STANDARD

An analysis of the requirements for true cable compatibility yields two requirements: 1) the TV or VCR must be able to be connected directly to the cable without a converter or descrambler ahead of it, and 2) the internal circuits of the TV or VCR must not pick up off-air signals directly. This direct pick up problem causes ghosted images and, in HRC systems, annoying diagonal bars in the picture. There are only two ways to avoid direct pick up. First the subscriber can avoid living close to a TV transmitter. Secondly, he can own a TV or VCR with adequate internal shielding. IS-23 is intended to set technical standards that make the second option realistic. Additionally, IS-23 deals with signal levels, connector types, and the allowable level of signals back fed into the cable. The standard went up for vote at the end of 1986. TV manufacturers found its

direct pick up requirement difficult to achieve. They've asked for further clarification and compelling evidence of the need for such a severe standard. The committee went on hold while this issue received further investigation. The committee will resume its deliberations in the third quarter of this year.

#### CONCLUSION

A lot of progress has been made. Communications between the cable and the the consumer electronics industries has increased and improved by several orders of magnitude. The result will be greater satisfaction with cable service as enjoyed through subscriber owned consumer electronics products. However, we must have realistic expectations. There are about 200 million television receivers in American homes that were designed before standards were accomplished. It will take time for these to be replaced with more compatible models. But that eventual goal would have never been attainable had it not been for the work of the EIA/NCTA Joint Engineering Committee and its subgroups.