

CABLE AND THE CONSUMER ELECTRONICS INDUSTRY

Claude T. Baggett

Cable Television Laboratories, Inc.

Abstract

Cable Television Laboratories, Inc. (CableLabs) has undertaken several very important strategies with the consumer electronics industry in an attempt to solve long-standing interface problems between the cable delivery system and the consumer display and storage equipment, and to coordinate future developments to enhance forward compatibility. Building on the foundation of relationships forged in the EIA/NCTA Joint Engineering Committee, CableLabs has taken the interface issues from the level of engineers to the industry executives and product planners.

Historically, the relationship between the cable and consumer electronics industries has not demonstrated much in the way of cooperation or communication. This has resulted frequently in unhappy customers and increased operating costs. The formation of the EIA/NCTA Joint Engineering Committee some years ago provided the first avenue of coordination between the two distinct industries. Issues and standards important to cable addressed by that committee have included the following :

EIA/ANSI-563: The Multiport Standard

IS-6: The Channelization Standard

IS-23: Tuner Design and Electromagnetic Compatibility Guidelines

Advanced Program Guide

This committee has also addressed numerous other compatibility and interface issues on an *ad hoc* basis. Most importantly, the engineering organizations within each industry have had the opportunity to discuss their concerns and goals. A brief status report of the above subjects follows. A

subsequent treatment of CableLabs activities will show relevancy to the general issues.

EIA/ANSI-563 Multiport

The cable industry has continuously voiced a long-term strategic need for the capability to insert signal processing of various kinds between the tuner and display portions of the television receiver. Originally, the thought was to place the descrambling function at this point, thus obviating the higher capital requirements and the public dissatisfaction associated with the use of a set-top converter. This is still a viable concept for our industry, but offers little value to the consumer electronics manufacturer and is probably counterproductive to the manufacturers of standard converters.

A deeper look at the strategic importance of having a signal breakout at that point in the receiver revealed several other important benefits, not just to cable but to the consumer electronics industry as well. For instance:

- Baseband interconnect from other consumer electronics hardware, such as VCRs and disk units.
- Insertion of after-market noise cancellation, decompression, or other signal enhancement devices.
- Interface to CE-Bus or other such home wiring systems.
- Applique closed captioning decoder as per recent federal legislation.
- Ancillary processors to facilitate the NTSC/HDTV transition period.

One large manufacturer has pre-production prototype receivers which were tested during January 1991 at CableLabs to determine compatibility with Multiport decoders. In spite of a considerable number of launch problems, there is still hope for Multiport.

IS-6 Channelization Standard

Cable and consumer electronics representatives have agreed upon an algorithm for determining channelization in excess of that previously set. It is anticipated that this interim standard will be canonized in the near future.

IS-23 Tuner Design Standards

This is the interim standard which has stirred the most controversy between the two industries. Of particular importance herein is a call by cable for a standard for direct pickup interference. At the present time, the United States has no standard for television receiver susceptibility above 30 MHz. Between 2 and 30 MHz, the so-called "Goldwater legislation" sets a standard of no visible degradation in the picture for ambient signals in the high frequency band of up to 1.0 volt per meter. This legislation was designed to protect ham radio operators from complaints by television viewers. At the extremes, Canada has a 0.1 volt per meter standard and Germany 4 volts per meter. Cable has asked for a minimum standard of no visible degradation in an ambient field of 1 volt per meter.

Other issues addressed in this standard involve tuner overload and local oscillator isolation.

Program Guide

Whether this effort is known as the "Advanced," "Automatic," or "Interactive" program guide, it is the same project and had its beginnings in Walt Ciciora's description of a smart, interactive program guide back in the early 1980s. The Program ID Subcommittee of the joint committee

has the task of defining the possible transmission facilities required on the cable system to transport programming data from the cable headend to the consumer electronics in the home.

With this summary of on-going EIA/NCTA Joint Engineering Committee activities in mind, let us now turn to efforts in the consumer interface being pursued at CableLabs.

Direct Pickup Interference (DPU)

There are two vital pieces of information required for cable to make a case with either the consumer manufacturers or federal agencies supporting improvements in tuner susceptibility standards for TV receivers and VCRs. First, some quantification of susceptibility to direct pickup interference for currently manufactured TV receivers and VCRs must be developed. Secondly, a division of cable subscribers into off-air signal field strength isobars, showing percentages and estimated numbers of TV receivers served by cable as a function of ambient field strength must be made. The obvious blend of these two efforts will show the magnitude of the DPU problem nationwide, and the degree of tuner shielding required for a 100%, 90% or 80% solution.

Currently manufactured television receivers are not uniform in their susceptibility to off-air interference in the tuner, neither industry wide nor as a function of manufacturer or brand name. There is a degree of correlation among receivers utilizing the same common chassis design. The purpose of the proposed DPU testing of receivers is to develop statistical data on the general state of consumer products relative to tuner shielding and isolation, and to determine which particular model numbers have extremely severe problems.

The above data, when coupled with information which shows the number of cable-connected TV receivers and VCRs residing in different field strength isobars in typical cable systems in the United States, yields the information required for

a long-term solution to this vexing problem.

It is doubtful that the consumer manufacturers would agree to, or that the federal government would require, a 100% solution to this problem, which could be very costly to the consumer. However, some level of remedy could be adopted which would solve essentially all DPU problems except those resulting from the worst case conditions, which are fortunately very rare, and would likely still require the application of a set-top converter.

CableLabs is being urged by its member companies to undertake the analyses required to develop the above-mentioned technical and statistical data to quantify the DPU impact nationwide.

A word of caution is required, however. Consider that the average television receiver sold in the United States has a life expectancy of 13 years, with approximately half of that time as the primary set in the home, and the other half in a secondary role. This means that a set sold in 1991, without the suggested improvements in DPU performance, is likely to still be operating in the year 2004.

Further, there does not seem to be any good way to retrofit existing receivers to improve their performance on a general basis. If we are successful in getting some resolution in 1991, then the problem will still exist on the main set of our subscribers through 1997, in decreasing numbers. CableLabs is also considering the possibility of some ancillary device or technique which would eliminate the effects of DPU without using the set-top converter; however this may only offer a low probability of success.

All of the above considerations apply also to VCRs. However, because of certain design features, they are generally less of a problem than the receivers. Also, their 3-1/2 year average life cycle means improvements penetrate our subscriber

base much more quickly than those made in television receivers.

In our emerging relations with the consumer electronics industry, it is difficult to find a tuner designer who is not well aware of the DPU problem and who doesn't have a sincere desire to make the required improvements. The problem is that this industry, which works on high volume and extremely low per unit margins, cannot identify either a price or market share advantage in its spending of their profit margin to fix the problem. CableLabs has several efforts underway which should bring market pressure on the manufacturers to implement fixes to their equipment. More will be said of this below. If these efforts do not yield satisfactory results, the only alternative left to cable is to request rulemaking by the FCC.

The EIA-Japan has recommended that consumer manufacturers adopt a double conversion tuner, such as those used in cable converters, into both TV receivers and VCRs. CableLabs is following this development closely, as it could represent our best opportunity for an amicable and long-term solution to the DPU issue.

Advanced Program Guide

It has become increasingly evident that the existing types of program guides available to our subscribers are marginally acceptable for today's volume of cable programming, and even less viable for the greatly increased amounts and types of programming anticipated in the future. CableLabs has undertaken a major effort to provide a cable-unique program guide with very customer friendly features for the future.

The general description of the guide anticipated is as follows:

- Uses a data carrier, thus liberating the video channel normally consumed by the current cable scroller guides.

- Is interactive with the customer, providing for the sorting of programming by factors other than channel number.

- Can automatically control the VCR without direct intervention by the customer.

- Can make long-range conditional recordings. (“...record any John Wayne movie I don’t already have archived.”)

- Will index the customer’s tape library with on-screen display to facilitate programming location.

- The in-home investment will be in the customer-purchased consumer electronics hardware.

- Can produce revenue streams via subscription, local advertising, and cross-channel promotions.

In 1990, CableLabs issued a Request for Information to 27 companies which had previously expressed an interest in television guides. Of the respondees, approximately six were considered to be serious in concept, in depth of understanding, and in resources. CableLabs will choose one or more of these companies to work with for the provision of the video guide of the future for cable’s exclusive use.

The important efforts under development for this project are not only technological in nature, but also include the marketing and business aspects of the venture. Negotiations with the consumer electronics manufacturers have revealed a keen interest on their part in cooperating with cable on this project.

Retailer-Cable Joint Ventures

In our meetings with the consumer electronics manufacturers, it became clear to CableLabs that they consider their customer to be the local electronics retailer, and not the ultimate purchaser of

the item. Therefore, the manufacturers respond carefully to the requests made of them by the retail stores.

Further, since the retailers and the local cable system do have the same customer to keep happy, and are not competitors, it would seem that some cooperation between these two entities would be useful. Several joint ventures have been tried around the country between a cable system and a local retailer and they have been very successful.

The basic scenario is that the cable system wires the store for full service, and, incidentally, must do a truly superb job of this and check it frequently for needed repairs. The store provides space for a fully functional cable business office on the premises. Service calls which possibly originate from a cable/consumer hardware interface problem, such as DPU, are coordinated with only one service representative responding. Further, an air of cooperation between the two industries makes for a much happier customer.

Cable has found that it is easier to sell both basic and premium services in the retail electronics environment and if the retailer is some distance from the normal cable business office, the customer appreciates the convenience of a closer facility. The stores have found that the cable customers who come in on cable business, but browse the store while there, can increase floor traffic from 10% to 20% by actual count. Several creative ways have been devised to reimburse the cable operator for the cost of wiring the store.

Consumer Electronics Liaison

As mentioned previously, a fairly good relationship has been established at the engineering level between cable and the consumer hardware manufacturers. However, in that industry, the engineers do not generally determine product features, so it became obvious that cable needed to develop a dialog with the executives and product planners as well.

CableLabs has worked diligently in this area over the last year and can report considerable success. We have been well received and have had in-depth discussions with the highest level executives at Goldstar, Matsushita/Panasonic, Mitsubishi, Philips, Sony, Thomson/RCA, and Toshiba. We discovered that they were generally

unaware of both cable's success in terms of subscriber penetration in the United States, and of the several significant cable/receiver interface issues. We will continue our discussions with these decision-makers in the consumer electronics industry and have hopes for more cooperation in the future.