

**Consumer Friendly, History, Hopes,
and the New Cable Law**

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Abstract

This paper reviews attempts at improving customer convenience when connecting their TV receiver to the cable television system. The Cable Television industry now must comply with a new Law which mandates much of what has proven impractical to impliment for cost conscious customers and MSO's. Some ideas will be presented as to how some of these features could be accomplished and where possible FCC intervention could preclude them.

Cable Television has always attempted to be consumer friendly. Cable came into existence because people who lived too far from the major cities of the country where Television was broadcast also wanted to to benefit from the available programming. The cable operators were often the owners of the local appliance store. They could, and often did, sell and install tall towers with antennas and rotators, or stand the expense of installing cable, and thus become a cable operator. Cable was, and still is, more friendly than most other delivery methods. When almost all of the television was delivered by the three Networks, cable systems had multiple duplication of Network channels. I remember a system where multiple channels were carrying the three networks. When asked why, the operator related that at 11 P.M. there were ten different late movies. Normal cable and amplifiers delivered

the twelve TV channels on their normal channel frequencies. Some systems carried the high band channels in the sub channel area (before systems became two way) and then block converted them to high band. That is why the sub channels are numbered T7 through T13. Channel converter boxes started out because of an environment that we are experiencing anew today. In New York City, the TV reception was always a problem because of the ghost problem. The problem was double trouble because the transmitters were on the highest building, The Empire State Building. With the cable system delivering the signals on channel, many of the receivers had direct pick up (DPU) on the 300 ohm twin lead or into the tuner. Teleprompter, the system operator, used a channel converter to move any selected cable channel to an unused off air channel, usually channel 3. An interesting side note here, even off air channels

using an antenna were improved using this technique against DPU. Cable systems generally converted off air channels to fill all 12 available channel slots, a situation that not all television receivers accommodated without interference. In the early 1970's the need for more channels, including UHF channels now carried on the cable system, prompted using the 9 mid band channels. At this time the real problems started. Only the DuMont TV receivers with their continuous tuners could access those 9 channels. Cable companies were not allowed to sell converters to the consumer, but had to supply them to access the channels. Early converter manufacturers attempted to supply cost effective converters to the cable operators. Some had wafer switch tuners and others had push-buttons. Interestingly, double conversion tuning quickly became standard. This mainly because of cost and performance. Since the levels into the converter were not too low, and most channels were of the same amplitude magnitude, double conversion worked well. Shielding against DPU in converters was better than TV receivers and coaxial shielding was maintained through to the TV receiver. Consumer friendliness was evident in that at least one manufacturer supplied the control part of the converter on the end of a 25 foot wire. Push-button tuning was achieved for initially 30 channels using 15 buttons and a two bank switch. Later versions extended to 36 channels using 12 buttons and

a three bank switch. One manufacturer developed a frequency synthesized converter with a wired remote control with digital entry. Remote control TV receivers started to come into vogue in the late 1970's and in markets where the cable converter could be sold to the customer (Canada), true cord-less remote controls using ultrasonic sound were developed. Since the control was more or less digital, calculator type entry, the number of tunable channels grew. In the early 1980's lower cost cord-less remotes were developed using Infra-red technology.

To go back into the early converter years, Pay television also became legal. Since TV receivers could not tune some channels, and there were few pay services available, early pay systems used "privacy" as a security method. They put the pay service where no one could tune it. The pay converter had a button or switch position that tuned to the pay channel frequency. Needless to say, that method of securing channels didn't last too long. As a more consumer friendly, but more operator costly approach, the operator drove a truck to the non-subscribers home and inserted a signal depriving trap into the CATV drop cable. This is a method that is still in use today in certain areas especially for services that are highly penetrated. As the number of pay channels increased and the penetration of those services decreased, it became desirable to find other methods of access control. In some cases, for low penetration services, an

additional carrier was added to the channel to overload the T.V. receiver circuitry and "jam" the signal. A nice side benefit of this technique is that the audio usually is jammed along with the picture. Subscription to the service requires a special trap be installed to remove the jamming carrier. This is not too secure a method since illegal traps are easy to procure. Even with these disadvantages, traps can be a good way for a small system to control a channel. Small is important because every change requires a truck roll, and the jamming carrier adds to the cable system to the same extent, or worse than, adding another channel to the system. In either case the system may require more trucks and need to hire more installers than some alternatives. A variant of this method is called "interdiction". Basically a local jamming carrier is added either at the tap or at the point of entry into the home, to preclude watching the jammed picture. As a cost reduction and to minimize the use of illegal traps, one oscillator may be shared time wise between a number of channels. Of course the time the carrier isn't sitting exactly at the correct frequency the sound, and maybe the picture, can be usable. Since good jamming requires relatively accurate jamming carrier levels, either the jamming oscillator or the whole signal ensemble on the cable must be gain controlled. To supply only the lifeline signals, and not the extended basic tier, this technique could be used to jam the extended basic tier.

Unfortunately the basic tier is the lowest cost tier, and now one has to add an expensive box to supply that lowest cost service. Interdiction has been offered for a long time and has not been accepted mainly because of a multitude of problems, including: security, frequency range, effectiveness of masking, resolution of who powers the unit (consumer or cable system?), radiation problems etc. As the number of pay channels increased and the number of people taking the additional services became a smaller part of the total, it became necessary to either buy more trucks and hire more installers, or scramble the additional premium channels. Most operators selected scrambling the additional channels as they simultaneously expanded their channel capacity. This meant a descrambler in the home of those subscribers taking pay services. Some operators continued to use traps for the heavy subscribed services and only install descramblers in the low penetration services. This still meant truck rolls for changes. Some attempts were made at addressable taps, which allowed the operator to turn off service if the subscriber elected to terminate service. The problem here is that every subscriber on the system has to have an addressable tap, and someone has to supply its' power. Even with this, there is no control over the pay signals. It becomes necessary to have some access control for those customers desiring to buy a pay service.

One other access control method whose concept

is being selectively demonstrated is the broad-band descrambler. Conceptually this unit can be installed at the point of entry to the home and selectively descramble all the authorized channels. Until more information as to which scrambling techniques are accommodated, potential piracy issues, powering, economics etc. are considered, the impact cannot be assessed.

This more or less brings us to where we are today. If a subscriber desires to take the basic service, and no pays, they get a cable installed into the home and their TV and VCR can tune and record whatever they want. If they desire a pay service that is scrambled, a descrambler must be installed. Depending on the subscribers viewing and recording habits, if a VCR is included in the customers system, either two individual descramblers are required or a "Watch and Record" configuration incorporating two converter-descramblers in a common housing is required.

There have been attempts at other methods such as placing a box on the side of the house into which addressable traps are placed. The box must be large enough to contain a trap for all the channels that are desired on the system. At the same time, they must be installed in all the homes in the system. If that isn't the case, then a truck roll is necessary anyway so why go to the trouble. If traps are to be used, it is generally better to have them up in the air on the cable or locked in a pedestal rather than on the consumers' home.

Presently the cable

operators are trying to make changes to their channel line-ups and systems to meet the requirements of the new "CABLE LAW". The Government has directed the FCC to generate rules to make CABLE more friendly, and lower cost if possible. They also encourage competition. One of the more difficult problems to be solved is that "lifeline service" which dictates that the normal off air channels in the channels' service area to be included, as well as Public broadcast Service (PBS) and public access channels. This lifeline service is supposed to be low cost and actually the minimum service necessary to get the cable into the house so that premium channels may be purchased. There have been various attempts so far at how the pricing is done. In one case, the lifeline cost is 80% of the former "Basic" service tier where all the service was either basic or premium. In the new tier arrangement, all the satellite services were put into the extended basic tier. This roughly 60 % of the basic service channel allocation cost only 20 % of the subscriber rate. In another case, the operator has taken another stand in that 50% of the rate is for the lifeline and the remaining for the extended basics. It would appear that neither of those allocations included any thought of paying for the carriage of the off-air stations, a feature of the law, since in both cases the total cost of the combination lifeline and extended basic is the same as prior to the partitioning. There was no charge listed for the

installation of the channel reduction equipment necessary for lifeline only service. Justification for either case could be made based on how much the local operator has taken advantage of local ad insertion as a source of income. Depending on how the court cases decide the "must carry" etc. part of the law, the off air stations may be able to demand carriage at some place in the spectrum where they have been all along or would enhance their viewing. An example, if channel 47 UHF has been carried on cable channel 47, and is now in the lifeline tier, one cannot merely trap (low pass filter) all channels below a threshold frequency for those subscribers desiring lifeline only. This would mean moving channel 47 elsewhere. That may or may not be desirable, depending on the feelings of the UHF station operator.

Indications are that scrambling is becoming the choice for extended basic and premium carriage. This is because trucks cost money, drivers cost money, and "Pay on Demand" type programming is becoming more popular. Based on converter shipments, straight pay is in a decline while Pay Per View (PPV) and Impulse Pay Per View (IPPV) is increasing in use. Some new developments are making this environment more friendly. One of the present developments is "Electronic Program Guide" with easier channel selection incorporating retuning. Another is the two tuner converter becoming available. A third, and too early to see how it will fare, is the TV

receiver, VCR descrambler interface. This came to us earlier as the IS-15 interface and now is EIA-563. This is an access control device that permits the TV receiver to do all the tuning and display functions while the descrambling is done in an external box connected to a socket on the TV or VCR. There is activity in the committees to update the standard to incorporate the hooks necessary to accommodate the expected digital compression and new On Screen Display (OSD) features expected soon. This activity has become very serious in that the Cable industry is attempting to help the FCC in solving the problems given to them by Congress.

One area that the Cable Law has not addressed but will have a significant effect on how systems operate is the introduction of digital programming. While the products in use so far only deliver signals to the head end for transmission to customers by conventional methods, equipment to carry compressed digital signals directly to the home on CATV will be delivered to cable operators next year. The exact services to be offered are not quite established yet but a number of major programs are being considered. In service now are systems which use satellite to bring to the cable head end, programming previously delivered on multiple FM Satellite channels, four to six programs compressed into one digital channel. At the head end the signals are de-compressed and delivered to cable customers by normal access control

means. Because of the premium nature and large number of channels of programming, most are probably using addressable converters. In the near future, those same programs will be delivered in digital form to the home. The fact that four or more channels are delivered on one channel means that in order to receive any of the signals, a converter-decompression box will be required. Another programming variation being considered is the Video on Demand (VOD) and Near Video on Demand (NVOD) concept. In the NVOD scenerio, it has been proposed that with the ability to compress ten movies into one channel, the same movie be given ten successive start times so that a 90 minute movie would have 9 minute intervals between starts. Statistically a person would wait an average of 4 minutes for their selected movie to start. During this time they could be retuned to a preview channel of similar type movies. When their movie selection start time came by, they would be switched to the appropriate movie start. In the true VOD scene, channels or really sub divisions of channels could be assigned as required for a movie as ordered. These converter-decompression boxes are probably not what the Cable Law conceived as consumer friendly. Actually the features that these converters have often exceed what the TV receiver offers, but a television receiver without a converter is disadvantaged. The comments related to the ability to Watch and Record, and view Picture in Picture previously discussed still

apply to digital compression. The digital signals require tuning capabilities that exceed those presently available in present day converters and television receivers. The definition of a cable-ready tv receiver will have to change substantially to be called digital-cable-ready. Changes will be necessary in the television receiver and the EIA-563 interface adapter plug to work with digital compression.

The FCC has discovered that the authors of the "CABLE LAW" never considered how the activities necessary to enforce the law would be paid for. The FCC is now considering a mandatory contribution from the cable systems to pay for this activity, which will subsequently be passed onto the cable customer. If the FCC forces the basic tier rates down, and Cables competition thinks that there is a great amount of money to be gained by supplying programming in competition to the CATV system, it would appear that the CATV operator with cable already installed should be able to supply that same programming at equal or less cost. In fact, if cable is not able to make money overall, the operators will be forced out of business. It is doubtful that this would happen without a fight.

The idea of competition to the Cable industry is incorporated into the name of the "CABLE LAW". Whether the FCC dictates that the conditions imposed on the competitors to Cable are the same that the Cable industry must meet remains to be seen. As a point of interest, CATV

franchises pay about \$ 800 million yearly to the cities in which the franchises exist. In the popular vernacular, would the alternate suppliers of premium programming also be expected to contribute a percentage off the top of their income? It is interesting to consider that the Cable System must supply the local off air channels unmodified (not scrambled or advertising changed) to the cable home, Public Broadcasting channels included. Up to one third of the channels must be these and public access (City Government, etc.) channels. Will the alternate (competition) TV signal supplier also have to supply this service? If a competitive supplier can supply only the Pay-Per-View channels, will it be permitted for the Cable TV Company to

supply only that type of material? With Cable systems being built with fiber to the node, a premium only service could be created in competition with itself. In fact, some dual cable systems presently have basic on one cable and premiums on the other. Is it allowed to sell only the premium? If it is allowed to do so, do the other performance issues spelled out in the law apply?

This paper has attempted to present some history of cable friendly issues as well as some of the techniques that can be employed to meet the law and still not create problems beyond what the customer had. There are more issues being discussed in Industry sponsored committees that attempt to solve the problems that we have been working on for years.