

## IS SCRAMBLING THE ONLY WAY?

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### ABSTRACT

A network of distributors must be created within and from the cable industry to market packaged video programming to customers beyond the reach of conventional cable. These companies will specialize in the marketing techniques, siting, installation, and maintenance services for the hardware, and collection of fees for the programming. In this way the unpalatable prospect of scrambled signals from the satellites can be avoided, and at the same time profitable new customer bases will be developed.

To develop and refine this approach while preventing signal theft by unscrupulous dealers and end users will require the cooperation of programmers, cable operators, and manufacturers within the NCTA.

### BACKGROUND

Thanks to the efforts of the program suppliers, cable operators, and equipment manufacturers in this industry there is a very large segment of the general population which is aware of, and would like to have, the kind of video programming available to us only from satellites (and heretofore through cable systems). But many of these potential customers do not presently have cable; indeed, many of them have very little chance of getting the cable in the next few years because of their location and the problems of stringing conventional cable to give them service.

There has been much press about the supposed proliferation of inexpensive satellite earth stations falling into the hands of private individuals who erect them in their back yard and steal signals from the fixed C-band satellites currently in use. This in turn has raised the question of whether or not the airways are free; an instant generation of "experts" on communications has developed who cite "examples": from the FCC annuls, or from industry sources, or from congressional

representatives to further their particular view on the issue.

I don't know if the airways are free, or not. I'm not a communications lawyer (though they don't seem to know either!). I do know that the FCC was very clear in its deregulation order in October of 1979 in which they said in part..."domestic satellites are a part of the modern telecommunications network and all existing satellites have been designated as fixed, not broadcasting satellites...signals transmitted over existing domestic satellites are radio communications intended for a specific audience, not for the general public. Hence, we conclude that the protections of Section 605 remain applicable to existing domestic satellite communications. Moreover, we recognize that as an alternative to legal enforcement of Section 605 programming parties have the option of scrambling the signal transmitted and thus making unauthorized reception and use much more difficult...we wish to emphasize that we are concerned about illegal interception of common carrier transmissions...however, we do not believe that our objectives of minimizing the regulatory burden in this area should be held hostage to those individuals who may be inclined to commit illegal acts."

### TECHNICAL CONSIDERATIONS

Some industry representatives have reacted to this situation with proposals that we scramble the signals from the satellites.

Two primary interests served by securing the video message are that only a properly designated end-user may view the decoded signal and that the encoded signal is not fit for redistribution or sale by any unauthorized party.

The encoding or scrambling of the video may take place at baseband or at RF depending upon whether the originator or an intermediate distributor who handles the RF signal is responsible for securing the program material.

Independent of whether the scrambling

of the signal is accomplished at baseband or at RF, it is the amount of security and the quality of the final signal which dictate the degree of sophistication and the cost of a given scrambler/descrambler implementation. There are two general cases which will serve as examples of scrambling needs;

1. Prevention of viewing by unauthorized end user.

Techniques which are low in cost and also low in security, relatively speaking, are often used for this purpose. Some techniques used are:

- a. Inversion of the composite video signal; this can cause improper clamping and loss of synch at the receiver,
- b. Insertion of an interfering carrier in the passband of the signal. This can cause AGC saturation, loss of synch and severe distortion at the receiver.

While these techniques may be simply implemented they also may be defeated relatively inexpensively and in the case of the second example leave a residual distortion which cannot be removed.

2. Prevention of unauthorized reuse of a broadcast quality signal.

The security and performance characteristics required for this purpose necessitate sophisticated techniques and high precision in both the scrambler and the descrambler. Virtually no residual distortion must be present in the decoded signal and decoding the signal must be possible only at great expense. The development and implementation costs of this system are substantially higher than those of case number 1.

If secure audio is to accompany the video transmission, the degree of security is generally commensurate with that required for the video, as are the cost comparisons. Digitizing the audio immediately provides a moderate amount of security at modest expense and provides one step toward highly secure audio scrambling.

OPPORTUNITIES FOR NON-TECHNICAL CONTROL

Scrambling of packaged video programming will penalize us all in terms of the cost of the programming, system relia-

bility, industry logistics, hardware costs technical quality, and consumer acceptance. The issue, it seems to me, isn't really whether the airways are free. It's what we are going to do with the existing opportunities we have with our knowledge of satellite distribution, the wonderful programming available only to us, and our strengths as an industry. We should not be spending energy, dollars, and time developing devices to prevent people who want it from paying for our services. And they are willing to pay!

While there are certainly ways to secure video transmissions using technical devices, I submit that there are other non-technical ways to essentially secure the video transmissions...the satellite programming that we are all so vitally concerned with.

I do believe that we've got to take pro-active steps to capitalize on an opportunity. We have been given (indeed many of us fought for) a marvelous chance to slightly modify our thinking and approach to the way we use satellite distributed programming. Manufacturers, for example, must respond with new equipment ideas, programmers must develop new rates for new markets (and some of them have) and begin to expand their concept of what an affiliate is, and cable operators need to create subsidiary companies to specialize in the marketing and service of these new areas.

We can't afford to limit our growth and ability to compete against other distribution technologies by thinking of ourselves as being only in the business of stringing cable to add subscribers.

Let me tell you why.

EXISTING MARKET OPPORTUNITIES

There is most emphatically a market for this programming that we are not now serving. There are more than 1,000,000 homes in the U.S. that receive no television at all; another 5,000,000 homes receive two or fewer channels of inferior quality broadcast television. Many of these will be customers. There are 230,000 multiple unit dwellings in this country representing 18,000,000 potential subscribers, many of whom do not have cable services. Several million of these households cannot be effectively served by conventional cable, but stand-alone earth stations represent an ideal solution to their needs. There are 37,000 hotel properties representing 2,000,000 rooms and it is certainly no secret that the lodging industry is clamoring for programming whether they have cable or not. There are 7,000 hospitals with 1,400,000 beds where

patients, in many cases, are heavily influenced by amenities such as television when they select doctors and thus hospitals. And all of these are markets for today...in many cases they lie within your franchises but you haven't reached them with your cable because they lie in remote corners of your franchise or in areas with low single home density.

Some of you now may be thinking, "But I can't put up an earth station there. How do I control the reception of programming? That's not like the cable business!" Well, let me share a few things with you. Yes, people can buy an earth station and just take the programming... they're doing it.

#### DISTRIBUTOR IS IMPORTANT

But I've talked with some of these people, and in many cases they aren't so thrilled at all. Consider the problems being experienced by the unfortunate few who have bought cheap earth stations from irresponsible pirate dealers...they're already having service problems, their dishes are blowing away, they have discovered in vivid color the real meaning of impulse noise. Some of these units will be discarded in disgust...because they weren't bought from a responsible distributor who knew how to market, professionally install, service, and provide the programming for these earth stations.

Should we really get into such a stew over these "backyard boondoggles" and scramble the life blood of our entire industry to cut them off the air?

Remember, I just quoted the FCC as saying that we should not be "held hostage" to these people. It is not necessary!

When we think of the need to secure the video which we all play a role in distributing, we must begin to think of ways to do that without degrading the signal, without reducing system reliability. Let us not hold ourselves hostage to a very small number of dedicated hobbyists who are willing to overcome significant obstacles to get satellite television.

We've talked about opportunities; we've taken note of the fact that homeowners, apartment managers and innkeepers are willing to pay from \$10,000 to \$30,000 for satellite reception as proof of the opportunity we all have. The public wants our service...why must we necessarily make drops from a coaxial cable suspended on poles? Why can't that drop be an earth station? We've looked at one alternative: that is the marketing of this equipment through a network of distributors who

understand the industry, the programming, and the hardware. We've seen that specialized hardware can increase user acceptance of the product while at the same time maintaining security of the transmitted video and program revenues for the distributor.

#### DISTRIBUTORS PROVIDE SECURITY

I prefer not to talk about direct satellite-to-user broadcasting at C-band with our present space craft...the system clearly was not designed to operate this way and the present industry structure certainly does not support this.

At Scientific-Atlanta, for example, what we are doing is not "direct". Our distributor (the cable operator) just as he always has, markets a service, installs the necessary hardware, collects programming fees, and provides maintenance. In some cases he owns all the hardware (as for a condominium or apartment) and in others owns the critical system component in the event that he doesn't lease the entire system.

We have developed special user interface devices which contain security and allow tuning of the microwave receiver only to those channels which have been marketed through our distributor (and by the way, greatly facilitate his installation as well as the user acceptance of the equipment).



Fig. 1. Remote Control Tuner with Security

The distributor provides service, maintenance, and financing and the whole range of services that are necessary to have any kind of a viable on-going business. Can you imagine buying a video tape recorder off the back of a pickup truck parked near a busy intersection outside of town? Would you buy it from a dealer who couldn't also sell you video tape and pre-recorded program material? I think the market for such a thing would be very limited indeed.

#### INDUSTRY COOPERATION

Let's think for a moment what else we can do together as an industry to help extend our businesses into new areas to grow and to compete from a basis of strength.

Programmers can help by establishing special rates for stand-alone earth stations - like ESPN has done for example. Manufacturers could perhaps pay a royalty fee to some kind of a tribunal for later distribution to programmers for every unit of product which they deliver to certain markets, or they can form joint ventures

with large program suppliers and cable distributors for complete packages which contain hardware allowing only the specified programming to be tuned. Competition among programmers is intense and new entrants with lots of cash are coming into the field as the future of our industry gets better all the time. With their fresh approach they are investigating new ways to distribute their programming to as many customers as they can possibly identify. There are many sources of programming, and hardware for the specialized job.

Now is certainly not the time to lapse into a protectionist mode and scramble signals. This is the time to move out aggressively as an industry to find new ways to capitalize on our strengths and compete for profitable additional business. I am pleased to have the opportunity to speak at NCTA on this because I think it is exactly the forum for this discussion - not the courts, not the FCC. NCTA should establish an industry committee to address this area, identify and recommend ways to move ahead without scrambling.