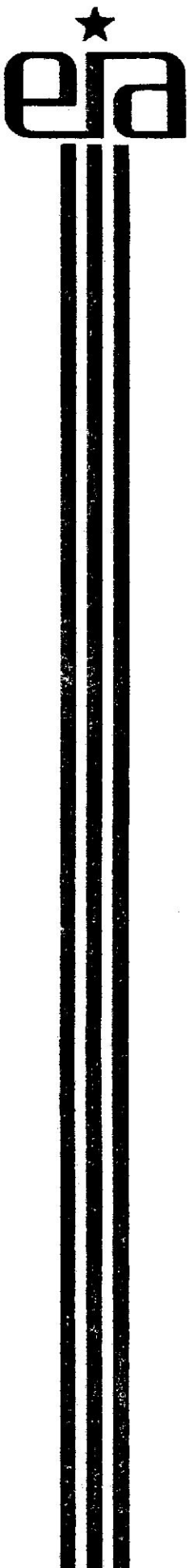

ELECTRONIC INDUSTRIES ASSOCIATION

TELECOMMUNICATIONS

TRENDS AND DIRECTIONS

A
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PREFACE

Telecommunications--Trends and Directions for 1980 was the fifth annual such conference. The series was started in 1976 to provide members of the financial community with an overview and update of the rapidly changing world of electronic communications. In that five years, the Hyannis conference has become a classic and is a recognized high point on the telecommunications landscape. In addition to attracting investors and financial analysts, the conference enjoys a growing reputation among telecommunication industry leaders who see the conference as a unique opportunity to place their own industries in a broad perspective.

As in the past, EIA's Communications Division is indebted to the panel moderators and speakers. Preparation and rationalization of a contemporary seminars program in a complicated field such as electronic communications is not an easy job. The scope of the industry is vast and diverse and products, services and technology not only are intermixed, but sometimes defy easy definition. Because so much is happening in our industry, we are each year able to present a fresh program, and the Hyannis seminars should be viewed as a continuum and an annual update of the electronic communications industry.

The following proceedings are a summary of the presentations made at our 1980 seminar, May 27, 28 and 29, Hyannis, Massachusetts. We hope you will be able to join us next year for the 1981 seminar which will be held in Hyannis, May 26, 27 and 28.

John Sodolski
Vice President

Presented by:

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DIRECT SATELLITE TV RECEPTION

The earth station business owes a great deal to Cable TV, for Cable TV has created an interest in direct satellite TV reception. A quick look at Cable TV will demonstrate that interest. Today Cable TV represents about 4100 systems, with about 29 million homes passed. Of the satellite TV programmers, WTBS represents the largest penetration, with about 1710 systems and 7.2 million subscribers. Home Box Office has about 1700 systems, with four million subscribers. But the big number to remember is that there are 29 million homes passed by Cable TV.

In flights of fancy, Cable TV operators will tell you that they someday expect to serve about half the nation. That means that direct reception can potentially serve the other half of the nation. It's a small market, but we're willing to live with that limitation.

The limitation of the Cable TV industry was pointed out by Bob Rosencrans of UA-Columbia just a few minutes ago, when he spoke about the required density of population to justify the installation of a Cable TV system. You have to be dense to be Cabled. A density of 30 to 60 homes per trunk mile is necessary to justify the installation of cable. There are a lot of places outside our major metropolitan areas where you won't see that kind of density. Those are areas not served by Cable. In addition, they may also have a limited selection of VHF and UHF television reception or poor reception. Those are the folks who have a keen interest in receiving satellite TV directly in their homes.

Legalities

It's not as easy, however, as you might think. The first issue that often comes up is whether or not it is legal. To address that fact, I always carry a copy of the Communications Act.

Section 605 is the most quoted section and I will quote it, of course, to my advantage. (I shall supply a copy of the full text to anyone who asks.) It says:

> ...no person receiving...shall divulge or publish...
> No person not being authorized...shall intercept...
> and divulge or publish...No person not being entitled
> thereto shall receive...and use...No person having
> received...shall divulge or publish.

I think what the Congress said in 1934 - and it has remained constant ever since - is that it is illegal to receive and do something else with that signal. The Congress recognized that you cannot regulate mere passive reception in the home because that is Short Wave Listening. As a practical matter, it is impossible for enforcement agencies to come into the home to find out, for example, whether someone has tuned in to 4 Megahertz, 2.5 Gigahertz, or 4 Gigahertz. If some day someone should show that I am wrong on this, then I pose a question to you. What about the person who can get any one of the five transponders which are devoted to free programming? Who will come into a private home, look over your shoulder, and see whether you are tuned into the Christian Broadcasting Network or Showtime? It is a matter of just touching the dials.

The next issue of legality often raised is: "Well aren't those folks entitled to some copyright fee?" As with the Communications Act, I also carry a copy of the Copyright statute. It says that the copyright holder has exclusive rights:

(1) to reproduce the copyrighted work...;
(2) to prepare derivative works...;
(3) to distribute copies...;
(4) to perform the copyrighted work publicly; and
(5) ...to display the copyrighted work publicly.

I think mere passive reception in the home is an area that was covered by the Sony Betamax case. Sony won. Again, as long as you are receiving and not doing anything with those signals, the copyright statute does not apply.

It helps to be a lawyer when you get into the direct reception satellite TV business.

Private and Multiple-User Systems

When you get into this business, you have to distinguish between two kinds of potential customers. First, we have been talking about the private home system owner. That person owes no copyright fee, and represents no revenue to the programming industry - except that those programmers carrying advertising will benefit. I believe Ted Turner has said privately that he doesn't care how many backyard terminals tune in WTBS, so long as he knows about it, and can tell his advertisers.

Secondly, there are multiple-user systems. These include condominiums, motels, trailer parks, and so forth. They will be paying customers.

Programmer Options

In terms of the home systems, programmers have some options. They can advertise. They could scramble - I'll talk about that in a little bit. They could institute some reasonable rates and get out of this hassle altogether. Or they could do nothing. I suspect that, realistically, the most intelligent thing for them to do is to do nothing whatsoever.

In terms of multiple-user systems, some programmers are already willing to make contracts in these situations which are, in effect, mini Cable TV systems. The programmers must come to grips with this market, and write contracts.

Market Size

Home backyard systems represent about 500 systems in the United States today. That's according to Satellite Week two weeks ago. I suggest that at full penetration, this market will represent somewhere in the neighborhood of 50 to 100,000 units at most -- there are severe limitations on direct reception satellite TV. To put some meaning to the numbers, assume that there are 500 systems today. At an average cost of about $15,000, that would put about $7.5 million of equipment in place today. If you look at maximum penetration as I have represented it to you -- and I believe Scientific-Atlanta's own internal estimate on the potential market for this type of equipment is about 83,000 units -- 100,000 units at an average cost of $11,000 (taking advantage of the assumption that there may be a drop in price), would represent $1.1 billion. That's a nice piece of change. As I drive around late at night, I say to myself: "How about 20 percent of a billion?" We may be the oldest company in direct reception, but we are not yet that big. We hope to grow.

New Markets

The excitement all centers on home systems, but there is another market which will pay programmers. It is MATV systems. There are a significant number of trailer parks, condominiums, apartment complexes, hotels, motels, and bars which already have distribution equipment. They don't have a forest of antennas on top of the building. They have one. They already distribute as if they were a cable system but they distribute in one contiguous group of buildings all privately owned. If they don't cross a public way, they don't need a franchise, they don't have to pay franchise fees, and they don't have to invest a whole lot of money in plant. They don't have to string wires. No strand.

In my view, MATV direct reception satellite TV will not compete with Cable TV. Essentially, nobody would go out and spend, let's say, $31,000 for a four channel system when he can get it coming in at only somewhere between $8 and $20 per apartment per month. It's a lot of front-end cost in a field that these poeple don't know much about. If they are already being passed by Cable, there is little justification, in my view. However, when folks are not going to be passed by Cable, or where franchise fights may go on forever, I get phone calls. People are asking me how much it would cost to install their own systems, and can we make contracts? Contracts with programmers, because they are due programming fees.

At the moment there are a significant number of services which will make contracts. Given the opportunity I have today, I have to twit the USA Network. Currently, they will not make contracts with MATV systems. It is my view that programmers such as the USA Network and Home Box Office are turning away found money. These are marginal revenues at low marginal costs.

The reason I suspect they are turning it away today is that they are head-over-heels fighting for new Cable systems. They haven't dealt with the issue of MATV. They are too busy doing other things. But the rate of growth of Cable TV will eventually slow down as they get to the point where systems have cabled all the significant areas with dense population. Then they are going to have to look at MATV. At that point, these new markets can be divided five ways:

- There will be the franchised areas where cable exists. I think most programmers will probably not do deals with MATV systems in such areas.

- There will be franchised areas that are cabled but, for example, that Cable system does not carry the USA Network. The USA Network might say: "We are still hoping to sell, so go away for a little while." But I think that if they haven't sold the USA Network after a while, (I really don't mean to hammer away at you, Bob), they may come around to saying: "We will do a deal."

- There are franchised areas not yet cabled.

- There are non-franchised areas that may someday be cabled.

- Finally, there are non-franchised, non-cabled areas that will never be cabled -- because the homes are too far apart.

All of those areas present different programming contract situations. These last three categories will develop over time.

Scrambling

Let's go back to the issue of security. I promised I would talk about it. This can also be considered the scrambling issue. People say: "Well, that's the answer to direct reception." But look at home terminals today, with maybe 500 systems in place. Even if it's 1000 systems, the number of homes receiving satellite TV pay programming, without paying for it, represents 0.003% of the revenue base. If we go to a 100% market penetration, at 100,000 units, you will see that percentage rise to 0.02% of the revenue base. That's why I suggested to you earlier that the best strategy today is that the programmers ought to do nothing at all. They should just forget about it, and instead concentrate on creating program contracts with those folks who are as yet unserved and could get their own earth stations.

Scrambling also has some other problems.

- It will cost something, and you will have to have redundant systems.

- It may be unreliable -- and for a desire to frustrate a few backyard earth station watchers, programmers may jeopardize an entire city's worth of Cable viewers.

- It invites de-scrambling. After all, the backyard people are either rich enough or quick enough to figure out something. They may yet crack virtually any reasonably priced system.

- It may hurt the competitive position of programmers. The programmer would be in a position of coming to a Cable operator and saying: "We cost $4 a month, and once we are scrambled you will have to spend $5,000 for descrambling equipment." A competitor could show up and say: "We cost $4 a month, and you don't have to spend another dime in equipment."

- It could take a long time to get all that scrambling equipment out there. It all has to be in place before scrambling begins. Home Box Office estimates that it could take as much as a year and a half just to implement scrambling.

In sum, there is a general feeling that the industry should not be held hostage by a small number of dedicated hobbyists.

MATV

The direct reception market is divided up into private homes and MATV systems. To put some number on that, let's take a system which starts with a basic earth station at $16,500 for a five meter dish, two Low Noise Amplifiers, tunable receiver, and so forth. For each additional channel of reception which you wish to distribute on your MATV system, you'll need another receiver, another modulator, some splitting and cabling, plus installation costs. We charge $5,000. For a four channel system, that would be $31,500.

If you take a condominium of 175 units, put some values on the software costs (programming fees), put a value on the hardware cost (the earth station), divide it up by the number of rooms, the number of months, and the number of years over which you amortize. Using conservative assumptions, we figure that can work out to about $7.10 per room, per month. In a trailer park, that's $7.10 per mobile home owner per month. His cousin down the road is in a Cabled area paying $16 per month. I think he will regard even $10 or $12 to allow for mark-up as a pretty good value. It gives you an idea that owning your own earth station, if you have a number of rooms to distribute it over,

may be a good idea. This augurs well for the folks who are in the microwave business. I thought I might mention some of the players from whom I buy or whom I like.

Suppliers

I like two companies in the receiving systems business: Microwave Associates and Microdyne Corporation. I personally buy a whole lot of Microdyne equipment.

Andrew makes fantastic antennas. They charge a lot of money for them. I can't afford them, but in general the performance of their antennas justifies the costs you pay.

Amplica and Avantek are Low Noise Amplifier suppliers. They both do a pretty good job and are highly competitive in price. They both do a fantastic job and are highly competitive in price. I choose Amplica.

I buy my cable from a New Haven company, Cablewave. I find them to be all reliable, attentive suppliers charging reasonable prices.

Market Limitations

Which leads us to just one last subject: the limitations of 4 Gigahertz (GHz). If I do nothing, I want to distinguish in your mind the difference between 4 GHz and 12 GHz. At 4 GHz to develop some reasonable gain, you've got to have an antenna over ten feet in diameter. One meter dishes, mentioned often in conjunction with the now delayed Comsat service, at 12 GHz, are inadequate. That is the principal reason the market for home installations will always be limited.

Perhaps this is a good time for me to tell you about some other limitations on backyard satellite TV reception systems.

There are trees and buildings. This is point-to-point communication. If a tree gets in the way, no reception is possible, and that is why I sometimes say: "Some of the best microwave engineering is done with a chainsaw."

The terrain can get in the way. If you think about it, one-half of all people who live on a hill, live on the north side. As a result, they don't have a view of the southern sky, which is where the satellites are.

A large number of homes are passed by Cable. Why should someone spend $11,900, when he can get Cable TV for only $16 a month.

There are zoning questions. I can't sell any dishes in Reston, Virginia, and I'm having some trouble right now in Eastern Florida.

There are cost considerations. Don't you believe that someone is going to sell $1,000 earth stations, using 12 foot dishes, shipped and installed.

There will always be an issue of complexity. If you don't believe that, consider these two facts. People buy automatic shift cars because stick shifts are too complex. And UHF doesn't do as well as VHF, because it is just a little bit trickier. You have one more knob to tune.

There will be questions of rooftops. Your average home cannot support a 10-to-16 foot dish. The roof was designed to keep out the rain and the snow, not to hold a 1,000 lb. antenna. Dishes present a large surface area to the wind. In a high wind, a dish looks like a very good sail.

There is microwave interference. Ma Bell does a significant part of its point-to-point linkage at 4 Gigahertz, using the same frequencies that are used for satellite TV reception. They have high power transmitters and high gain antennas competing with a five watt satellite, 22,300 miles away with 196.5 dB of space loss. The signal from the satellite is measured in nanovolts, not microvolts, by the time it gets here.

Finally, and some of you in the room will hate me for saying this, but wives are some of the biggest impediments to sales of backyard dishes. I speak from experience.

I was about to close a sale in Eastern Massachusetts. The man was willing. We had cleared the site for microwave interference. The dish would go to the side of a garage. But I told him that he would have to cut off a branch of a near-field tree, and a tree 200 feet away in his 15 acre forest. That's one branch and one tree. His wife said no... quietly. I saw $16,500 walk away.

COMSAT

There you have some of the limitations on the market at 4 Gigahertz. When you go to 12 Gigahertz, as with the COMSAT proposal, all of a sudden you have to start worrying about an Act of Congress. You also need an Act of the United Nations.

You may have heard that there are 12 Gigahertz satellites elsewhere in the world. However, in Region 2, which includes North America, WARC meetings on 12 Gigahertz Direct Broadcast Satellite service won't begin until the second quarter of 1983. You literally need an Act of the United Nations.

You have to have a satellite. As RCA discovered when it lost one, it takes a while to build one.

You need a rocket ship, and unlike trolleys, they don't come along every 20 minutes.

You need programming. That means you have to get in to the ring with some heavy duty fighters like Premiere, Home Theater Network, Showtime, Home Box Office, and Warner Amex. There is a limited number of movie studios in this country and abroad.

Finally, you have to get some distribution. As COMSAT learned, Sears isn't the easiest organization to negotiate with. I think COMSAT will find that nationwide distribution will be a problem. On the other hand, Channel One would be pleased to begin talks.

Thank you.