

# THE REAL WORLD – THE USER

by

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## ABSTRACT

Satellite communication is by far the most advanced of all commercial applications of space technology. This presentation will look at the past, present and some future possibilities for the field of public communications. It will also examine some serious concerns that are becoming apparent to the user of this technology.

## DISCUSSION

“Sputnik” – “Vanguard” – “Explorer” – “Score” – “Echo” – “Telstar” – “Relay” – “Syncom” – They are all names that have little meaning to anyone under the age of 25, yet, every one of them has played a critical role in the ever advancing technology of space communications and its development as a commercial venture.

To those of us who were around then, – who can forget the surprise and shock of hearing that faint electronic beep-beep-beep from a small globe circling the Earth – put there by the Soviet Union in October of 1957 – “Sputnik” – the first man-made satellite.

Or, the despair on that day several weeks later when some of us stood on the beach and watched as “Vanguard” – this country’s first orbital effort for the Geophysical Year – rose – fell back and exploded on a launch pad at Cape Canaveral.

And, isn’t it prophetic that we should be meeting here in Huntsville where Wernher von Braun and his team hastily put together the first U.S. satellite – “Explorer 1” for launch in January of 1958.

But, it was project “Score” – launched on top of an Atlas rocket, number 10B to be exact, carrying President Eisenhower’s Christmas message to the world from low-earth orbit in December of 1958 which truly started the age of satellite communications.

Commercial enterprise quickly recognized the potential of space communications and the AT&T “Telstar” low-earth orbit satellite was the first step in what has developed into a world-wide communications network which is operated by INTELSAT as a consortium of participating nations. To those of us in my business, Public Communications, it was an incredible breakthrough. I remember sitting in a television control room and bringing to the viewing public LIVE pictures from London for the first time ever. A new dimension to a rapidly advancing technological society. But, those brief minutes of Telstar “opportunity windows” were limited and

complex because the satellites were in low-Earth orbit and had to be tracked across the sky by large motorized dishes during the “passes” which brought them above the horizon in view of Andover, Maine and Goonhilly, England.

Sir Arthur Clarke’s prediction of geosynchronous satellites got its first test with “Syncom II”. Although never designed with television in mind, it was in fact used for that purpose in October of 1964 when the entire opening ceremonies of the Summer Olympics in Tokyo were transmitted LIVE to the United States. It proved the point for us.

The dam had burst, and the Earth was getting smaller. With the development of the INTELSAT global system, and domestic regional capacity, it is now possible to provide almost instantaneous and continuous communications from just about any place on the Earth. We are able to see and hear with commonplace regularity the sights and sounds of events like the Winter Olympics taking place in Sarajevo, Yugoslavia this week, or watch a war with its death and destruction from Lebanon or the Falkland Islands.

Maybe, someday, such tragedies won’t occur because they are no longer abstract events when people see them happening in real time.

All of us in this room are involved in industries that are undergoing tremendous change. And for me, modern technology has – and continues to – revolutionize the information and communications business.

My purpose in being here is as a user – not to entertain, but to perhaps give you some thoughts for the future.

How often have we heard the phrase, “There’s nothing new under the Sun?” We heard it used earlier by John Egan in a very affirmative manner.

Well, unless the laws of physics and chemistry are wrong, that is true. What is new, however, are the uses to which we put the knowledge gained from those laws and our experience. To do that successfully takes imagination, human ingenuity, a little luck, and a lot of guts.

Public communications has been far from immune to new ideas, and television has been one of the most volatile segments of that field. (Perhaps, though, it might be better to replace the word “television” with “CRT Usage”.) Change is running rampant.

To quote from an article I read in the Atlanta Constitution not too long ago: “It is as if the entire industry has come off the highway it has always known, and onto a traffic circle with several exits. A few companies are circling, trying to decide which road to take to get farther ahead. Others are driving down new roads – but they’re watching in the rear view mirror to see where the rest are heading – and wondering if they’ve done the right thing.”

Visualize, if you will, that traffic circle with exit signs labelled “Cable,” “Videotext,” “Wired Society,” “Addressable,” “Interactive,” “High Definition,” and “Direct Broadcast.”

Let’s examine a couple of those roads and see where they lead. In actuality, some of them will merge again over the horizon.

One of those roads – Cable TV – has had explosive growth. How did it all start? Interestingly, it started with a small appliance dealer in the hills of Oregon in 1948. He had television sets for sale in his store, but because the community was in a valley, no one could receive the signals coming from the nearby metropolitan center where the TV stations were located. Using his ingenuity, he installed an antenna on top of a nearby hill where he could get the signals, and ran a wire down into town so those television sets could receive the programs. CATV, community antenna systems to bring the signals into fringe areas. The first cable systems.

Federal regulations limited the amount of service they could provide, and restricted their growth in major population centers. In 1965, cable served only about one million households in the entire country.

Over the next ten years of regulatory “jockeying” cable grew slowly. Late 1975 and early 1976 brought the turning point not only with “rules” changes, but the dawn of satellite distribution. The use of private enterprise communications satellites for central distribution of programming became a reality. With just one channel of a domestic satellite in geosynchronous orbit, a signal from one ground station can be sent to any location in any area all the way from the Carribean Islands and Maine in the east, to Alaska and Hawaii in the west. And, as many points in between that have satellite dishes. Point to multi-point distribution. Today cable is reaching over 31 million homes.

Those satellite dishes started popping up like mushrooms not only at cable systems, but in back yards all over the country as the cost diminished. Some of you may recall the 1979 Nieman Marcus Christmas catalogue which showed a TV satellite receiving dish for \$35,000. Today, a similar installation can be done for about one-fourth that cost. And, there are some home units selling for under \$1,000.

Satellite delivery has created a new, or substantially changed, market place and opened avenues for innovative thinking. My boss, Ted Turner, is certainly one of the leading examples of someone with that capacity for innovation. We now have four services which are satellite delivered. Superstation WTBS, Cable News Network, CNN Headline News which not only services cable homes but a network of television stations across the country, and CNN Radio. And, it isn't only domestic. We provide several hours a day to an Australian Network via INTELSAT, and shortly will start direct service to Japan. The U.S. Armed Forces Network carries a substantial amount of our programming worldwide.

The globe is getting smaller.

But what about some of those other exits off of the hypothetical traffic circle?

High Definition is coming, and the only practical way to deliver it is by satellite.

So is Digital television. It is interesting that the only real impediments to a functional digital television system are the existing television station transmitters and the millions of existing TV sets which are analogue. Within most television production centers today, signals are converted continuously from analogue to digital and then back to analogue for transmission to the home receivers.

I see the day, not too far away, when someone will market a component digital television receiver which becomes part of an ever more sophisticated home information center.

We are all very much aware of the exponential growth of home information tools. Just look at the sales figures for home computers, video cassette machines, video games, and digital stereo systems. And, I certainly don't see any slowing of that growth.

The growth and changes haven't all been restricted to television either.

The printed media have become painfully aware of the necessity for change. A couple of years ago a major study was undertaken to examine the impact of electronic information systems on publishing. Particular attention was given to the key events that could influence the evolution of, and the interaction between home electronic systems and the print media.

The computer age already has changed the inside of the newsroom, and inevitably will change the way newspaper produce reaches the subscriber. The traditional system of delivery — from plant to truck to delivery person to front door — cannot survive. It is too costly and too time consuming. We all have been made acutely aware of the problems of some newspapers over the past couple of years, and we mourn the passing of such outstanding publications as the Washington Star, The Philadelphia Bulletin, and others.

Now, I am not one of those sounding the death knell of newspapers, however. I think that generally their future is secure, as long as they recognize the need to adapt to changing conditions, and act accordingly. Electronics should not be viewed as a threat, but as an ally. It will allow the transmission of textual information directly into the home bypassing today's outmoded and economically unfeasible system. Some are already trying it. Newspapers such as USA TODAY, The Wall Street Journal, and The New York Times are being centrally prepared and satellite fed to printing plants around the country. Can transmission either by cable or direct to the home be far behind?

Generally, home electronic services can supplement and compliment printed features if publishers take timely advantage of the electronic trends underway and build a capability to provide electronic information services.

A key element in the growth of those services is the extent of penetration of households by electronic equipment. I've already pointed out the growth rates of cable TV, home computers, video cassette machines, and satellite receivers. So those signs are all there.

I expect by the end of this decade we will be seeing a massive transmission of data into the home and office. A person will be able to punch a few buttons to select a multiplicity of information sources on their CRT or "information frame" hanging on the wall — which uses liquid crystal display technology.

The information explosion which is engulfing all of us can't be all one way though. There has to be a form of inquiry and selectivity beyond the knob on the television set or the converter box which provides selectivity amongst all those channels. Everybody doesn't have a need for all that information all of the time, and we can't store it all in that desk top computer terminal we're beginning to live with.

That brings us around to a couple of more exits on the traffic circle – “Addressability” and “Interactivity.”

The information supplier doesn't necessarily want his product to be received by all those millions of possible recipients out there. The entrepreneurs who are busy developing electronic mail delivery don't want you or me reading somebody's steamy love letter to his girl friend or a proprietary business proposal between two companies. So, there is a real need for a secure method of establishing discrete one-way communications and multi-faceted high speed interactive two-way services.

Perhaps the tremendous growth of electronic banking service is one of the best examples of the direction we are headed.

Security of product is a major issue. In some quarters of our business, piracy is rampant. The pay television services are losing millions of dollars per year through theft of service. That's why they are pouring large resources into the development of alternative approaches to the way they are currently operating.

Just yesterday I heard of a group of high school kids going around a newly cabled neighborhood offering, for \$10, to “fix” the subscriber's cable tap so they could receive the premium services.

What's the answer?

Scrambling is one. But, in this day and age it doesn't take very long for a good electronics mind, or a high school whiz, to figure out how to unscramble a signal.

Individual addressability is better. That's relatively easy in a “closed loop” or wired system, but not so easy for a mass single point to multi-point network of millions of homes. And, its still only one way.

I'm sure some of you out there are saying, “This is all very interesting, but what has it got to do with a Symposium on Future Space Industrialization?”

There can be little doubt in any of our minds that communications industries have been the greatest beneficiaries of space activities. It is the most highly developed and commercialized of anything to come out of the space program. So what's left?

Lots!

Back in 1973 I wrote an article for the Overseas Press Club magazine titled, “2001 – It's Old Hat” which described some of the tools which I believed would be available to the television journalist of the future.

I said he would wear a device – perhaps the Dick Tracy wrist watch – which would provide him with two-way satellite voice communication with his home office from anywhere in the world. He would carry a camera and recording device probably no bigger than today's home movie cameras. He would have in his electronic briefcase a small “pop open” inverted umbrella antenna with pointing instructions which would allow him to increase his two-way

capacity to include video transmission. He would have a micro-miniaturized computer/printer terminal that would allow him to query and receive printed research material, and transmit his completed report back to his home base.

Doesn't sound that far fetched does it?

Some people thought I had lost it back then in '73, but let's look at where we've come since then. At that time, the camera and recorder combined weighed over 100 pounds – today its about 15 to 20 and getting smaller. Back then a briefcase computer terminal was unheard of – today they're commonplace. Back then you had to find the nearest telephone booth to talk to the office – today ground-based mobile systems are everywhere and growing at break neck speed with the development of cellular radio. The portable satellite uplink may not be briefcase and umbrella size, but they are getting smaller and more mobile every day. If we can make one that can drive around on the moon's surface and send signals to Earth, we can sure do it a lot closer to home.

What's a Space Station going to do for me – the user in the next few years?

To start with, it's going to manufacture microprocessing and storage chips which are so dense in their capacity that my whole reporter's system might be no bigger than a pack of cigarettes. The lens will be the biggest thing on the camera/recorder. And, speaking of that, lenses will be developed in space that will be so pure that they will be close to perfect transparency in their light transmission characteristics.

Solar power generation cells will be manufactured that are so pure and efficient as to make today's look like a Model T compared to the Space Shuttle. And, those same cells will be assembled into "power wings" that will drive propulsion systems to get me where I want to go – the geosynchronous highway.

Up there will be real switchboards in the sky which have been assembled in low-Earth orbit. The manned space tugs will carry the parts and pieces from low-Earth orbit so that we won't have the horrendous hundred million dollar losses like the ones we saw last week when two communications satellites didn't make it. In other words, a geo-platform.

The future generations of communications stations will have arrays of steerable antennae which will allow spot beams narrow enough to service individual cities, or broad enough to cover the whole country. They will be able to talk to other satellites in the arc so that it won't be necessary to come back down to Earth in order to get more than one third of the way around the globe.

There will be enough power generated on board those satellites that signal strength back down to Earth from high technology advanced high power amplifiers will be sufficient to allow individual home receivers that use "dishes" no bigger than a coffee cup saucer. Full range, direct broadcast will be a reality. Receiving antennae on the satellites will be big enough that they can receive "mini-power" signals sent from those very same coffee cup saucers making every one of them in individual homes or offices addressable, interactive, and discrete to a vast array of information sources.

Those space based switchboards will be able to maximize the interface between a myriad of frequencies. Today we're scratching the surface of KU and KA band utilization. There's

still a lot of spectrum beyond that to be challenged. And, with the demand for positions in the orbital arc all around the world, we're rapidly running out of room.

To some there may appear to be a glut of capacity today, but I guarantee you that it won't last very long, and we must develop the capacity to accommodate future needs. And there has to be redundancy and flexibility to provide protection.

One of my greatest concerns today is the security of our system. In recent months there have been several occasions when users, such as ourselves, have been "wiped out" by interfering transmissions. Today it is possible for almost anyone with a good electronic knowledge to buy off the shelf parts and put together a home made transmitter that could seriously impair the Public Communications industry. We must have alternatives that guard against such occurrences.

I've postulated on a lot of things in just one tiny segment of the potential industrialization of space. Is there a market there? That's for you to decide. I certainly believe there is. Space communications is the most cost efficient method of moving information, and our society increasingly demands and uses more information faster and in greater quantities than we can conceive.

I don't see any diminishment of that demand. Earlier, I used the phrase "Nothing new under the sun." Well, I don't believe a word of it!