

Communications satellites: A revolution in international broadcasting

By Irving Goldstein, vice president and general manager, COMSAT

In the last 20 years communications satellites have brought revolutionary changes to communications in general, and to international broadcasting, in particular. Satellites have meant not only live coverage of world events, but also more service to more people at lower costs. The fact that the phrase "live via satellite" is commonplace, testifies to the impact of satellite communications. "Live via Satellite" has characterized the evening news and special events such as World Cup Soccer, the Olympics, the installation of the Pope, and President Carter's peace seeking journey to the Mideast.

On the international level, it is the cooperative efforts of governments and private entities in over 100 nations participating in INTELSAT, the International Telecommunications Satellite Organization, which makes international television broadcasting a reality. In the United States, COMSAT, the Communications Satellite Corporation, has been charged with this responsibility and is the US participant in INTELSAT. Such cooperation did not come about, however, of its own accord but was the product of concerted effort and planning.

Historically, the broadcasting po-

tential of satellite communications was first demonstrated in 1960, with the launching by the United States of ECHO I and II. These satellites bounced radio signals across the Atlantic, and hence were known as passive satellites. This type of satellite, however, was not the most appropriate for communications purposes; it was superseded by a more technologically advanced active repeater satellite, TELSTAR I, which was launched two years later and which demonstrated that color television signals could be broadcast across the oceans.

Later, in 1962, with the potential of international communications becoming increasingly apparent to the United States, Congress passed the Communications Satellite Act, which, among other things, created COMSAT. President John F. Kennedy foresaw the coming changes in broadcasting and communications. In signing the Communications Satellite Act he observed: "The ultimate result will be to encourage and facilitate world trade, education, entertainment and many kinds of professional, political and personal discourses which are essential to healthy human relationships and international understanding."

As a consequence of this legisla-

tion, COMSAT was charged by Congress with responsibility for the establishment, in cooperation with organizations in other countries, of a global commercial communications satellite system as quickly as possible.

US initiative under the Communications Satellite Act combined with growing international interest in this new technology lead to the formation of INTELSAT in 1964. Beginning with only a handful of member nations, INTELSAT has grown until today more than 100 countries participate in the ownership and operation of the INTELSAT global satellite network. Since its inception, INTELSAT has made high quality reliable international telecommunications services available on a regular basis to all areas of the world.

Acting as a technical manager of INTELSAT during its initial growth period, COMSAT developed INTELSAT's first geosynchronous commercial communications satellite, Early Bird, thereby making a reality the concept envisaged some 20 years earlier by Arthur C. Clarke, the noted British science fiction writer. In 1945, Clarke had observed: "An 'artificial satellite' at the correct distance from the earth would make

BE covers satellite communications

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| May 1966: ABC proposal | | | |
| Sep 1966: TV relay | | | |
| Feb 1967: NCSCT meeting | | | |
| Apr 1967: unauthorized interception of SCA | | | |
| May 1967: for network relay | | | |
| Oct 1967: program proposed | | | |
| Dec 1967: Pacific II | | | |
| Feb 1968: satellite-to-home broadcasting | | | |
| Oct 1968: CBC CE addresses | | | |
| | Feb 1974: broadcasting from Jupiter 10 | | Aug 1978: COMSAT service |
| | Jun 1976: broadcasting from Viking | | Sep 1978: COMSAT service |
| | Sep 1977: general | | Nov 1978: Scientific-Atlanta tracking terminal, Mutual applies for satellite use, COMSAT's UN experiment |
| | Dec 1977: domestic | | Dec 1978: Canada funds, Chinese see earth stations, future of, Scientific-Atlanta earth station order |
| | Jan 1978: Mutual Broadcasting & Western Union | | |
| | Feb 1978: conference on | | |
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one revolution every 24 hours; i.e., it would remain stationary above the same spot and would be within optical range of nearly half the earth's surface. Three repeater stations, 120 degrees apart in the correct orbit, could give television and microwave coverage to the entire planet."

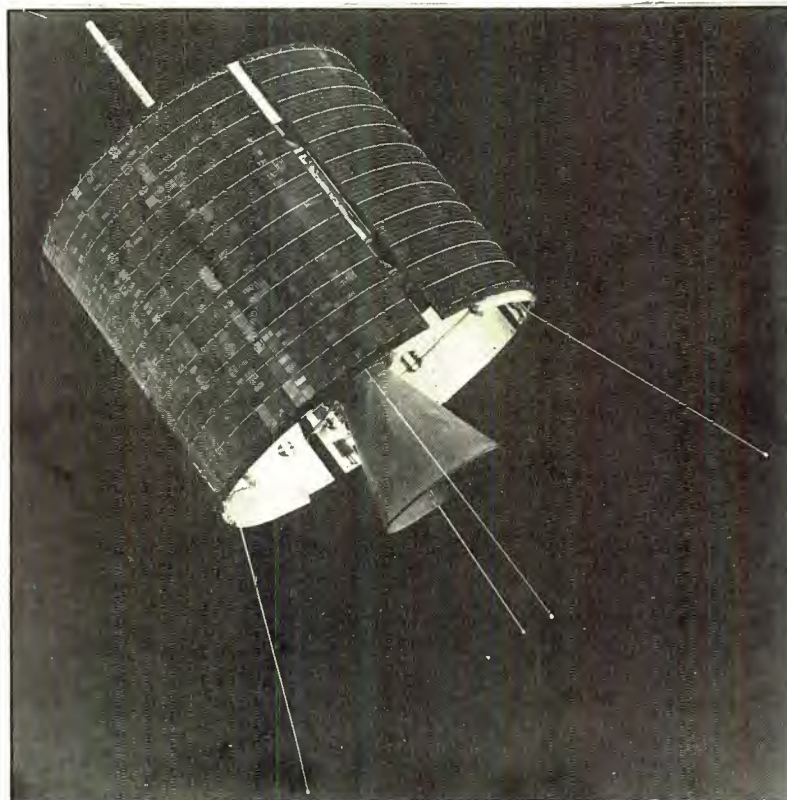
In early 1965, Early Bird (also known as INTELSAT I) was launched from Cape Kennedy and placed in synchronous orbit 22,300 miles over the coast of Brazil in April 1965. This launch marked the first step towards a worldwide network of satellites linking people of many nations. Early Bird, the only mode of live transatlantic television, in July, 1965, provided the first live telecast via INTELSAT satellite to the US, a US versus USSR track meet.

Although a dramatic improvement over the then available transatlantic telecommunications facilities, Early Bird was nonetheless limited in capacity and capability. For example, in order for the only television channel to be operative, all 240 voice channels had to be shut down. Today, however, technology permits the simultaneous transmission of both voice and television with significantly increased capacity. Further, the costs of Early Bird were quite high when compared to today's rates. For example, the 1965 rate for a color television transmission between New York and Paris was \$13,070 for the first 10 minutes and \$240 for each additional minute. Today's rate is almost one-tenth the original charge, \$1,618.50 for the first 10 minutes and only \$55.50 for each additional minute. Lastly, the anticipated life of communications satellites has more than quadrupled. From a predicted life of 18 months



Intelsat V satellites, planned for launch beginning this year, will employ two advanced frequency reuse techniques.

Intelsat I (Early Bird), the world's first commercial communications satellite, was placed in service in June 1965. It established the first satellite pathway between the US and Europe and made live transoceanic TV possible.



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Communications satellites

for Early Bird, today's satellites are expected to be operational for seven years.

Following the introduction into service of Early Bird in the Atlantic Ocean region, there still remained the challenge of developing a global network. This challenge was met only a few short years later. An INTELSAT II satellite was successfully launched and placed in synchronous orbit over the Pacific in 1967, and in 1969 an INTELSAT III satellite was launched for Indian Ocean region service, thereby completing the provision of global coverage. Fortuitously, global coverage capacity was augmented just in time for what has been estimated as the largest TV audience in world history to see man set foot on the moon. That which had been a vision by Arthur C. Clark some 20 odd years before, and a formidable legislative mandate less than a decade previously, was now a reality.

Establishing an international network was only the beginning however. Development and maintenance of succeeding generations of satellites, providing expanded services at lower costs, with enviable reliability records has been a continuing challenge consistently met by INTELSAT.

Currently, the INTELSAT IV and IV-A satellite series provide communications and broadcast service over the Atlantic, Pacific and Indian Oceans. With greatly improved signal handling capacity, each INTELSAT IV-A can relay up to 6000 phone calls and two television programs simultaneously. The availability of expanded satellite capacity for broadcasting, combined with a growing reliance on live international television to put people in touch throughout the world with major happenings, is reflected in the increased use of INTELSAT for television. The demand for international television transmissions to be carried via INTELSAT registered more than 50% growth during 1978.

Satellite transmission has also expanded the horizons of closed-circuit television. A variety of dramatic special purpose telecasts via satellite have demonstrated a large potential for public and commercial applications in the financial, industrial, scientific, educational and governmental communities. This has

generated new attention to television for sales and promotion purposes, and for training programs, briefings, consultations and conferences. For example, highly successful auctions of industrial equipment and art have been held via satellite, thereby expanding the audience from room-size to international proportions. Also, a major raw materials company has telecast dedication ceremonies at its new iron ore mine in Sydney to simultaneous meetings with potential customers in New York, Tokyo and London. In addition, companies with shareholders in many countries are using satellite closed-circuit TV in conjunction with their annual shareholder and other important meetings.

Besides the advantage of immediacy, communications satellites offer the ability to transmit TV signals to a large number of receiving points simultaneously. Such a capability reduces the cost to each receiver and eliminates the need to ship film or videotape. No longer must one contend with packing, declaration and documentation, insurance, customs, brokers, transfers to and from airports and the other associated red tape and headaches.

Quite recently, decisions have been made in the US which will facilitate the provision of international satellite services directly to broadcasters. As a consequence of the FCC's response to the request of Spanish International Network (SIN), COMSAT will be able to provide satellite television services directly to US broadcasters and other users. Thus, for COMSAT as for the American public, the impact of "Live via Satellite" is just beginning to be felt.

Growth in technology, imagination, capability, and expertise guarantees continued growth and success of satellite communications. Indeed, the extent of future growth of satellite communications is limited only by the imagination of man. The time which has elapsed from the introduction of Early Bird in 1964 to the launch of the present satellite generation has been short; yet the effect on the world community has been startling. It is international broadcasting which has caused a considerable degree of this dramatic change, and will continue to do so, thanks to communications satellites. □