Satellite Communications

Satellite communications are the outgrowth of development in two main areas, space technology and communication technology. The first requirement for any space activity has, however, nothing to do with the state of technology since it concerns the ability to compute the velocity needed to escape earth's gravity and, as a next step, to a satellite in orbit. This knowledge comes out of a very old branch of science, celestial mechanics which began when man first studied the motion of stars. The key technology in space flight generally is propulsion since the problem of launching objects into space revolves itself into securing initial thrust required to escape the gravitational attraction of the earth and to give the space object the velocity necessary to hold its course by the inertia of its motion. The ability to provide transportation services for a wide variety of spacecraft has progresses rapidly. The early efforts of the late 1950s involved modest mission any pay load requirements and were generally concerned with the launching of relatively simple space research experiments. The programme of the early 1960s expanded into such areas as lunar and inter-planetary probes. Today, a wide variety of spacecraft are launched on a routine basis. A family of proven launch vehicles exists which can be adapted to specific mission needs.

Rocket technology is more capable of accelerating useful payloads to the very high velocities required to orbit the earth, to escape the earth and go to the moon and the other planets and also of providing a high degree of precision when placing objects in orbit around the earth.

The existing rocketry power, to place satellite in orbit would, however, be of no practical value in the absence of efficient communication with the spacecraft. No meaningful activity in space would be possible without these. Space communication and computer technology depend on innovations and advances in electronics which started with the transistors invented in 1948. Since then the trend has been towards ever smaller, more reliable and versatile electronic devices which have become essential in aviation equipment, computers, space and communication industry.

The communication satellite is described as the climax of the revolution in communication and information which is to change our world into a global village. Some regard satellite communication as a further step towards still more powerful and all pervasive mass media whose contact binds individuals to a technocratic order. Others foresee a global mass of individuals more or less helplessly reeling under the impact of constant floods of incoherent information. Changes in the communication system which make it possible for more people to

get access to more and a greater selection of information, education or entertainment might in themselves have far-reaching consequences, regardless of the content at a given moment. The sheer presence of television is expected to break the feeling of isolation in remote communities. The anxieties and fears that have been expressed with regard to the possibility of unwanted television broadcasts via satellites recognise the importance of both the medium and the message, whatever, the theoretical position is taken. There is also a recognition of the much greater impact of television as compared to such a medium as short-wave radio as well as the concept of certain kinds of content being more acceptable – or unacceptable-than others.

It is often said that one of the main consequences of modern communication technology, as specifically represented by satellite communication, would be instantaneously and universally available information. The problem would then be one, not of availability, but of selectivity. This would imply the recognition of the need for new kinds of education so that “people can cope efficiently, imaginatively and perceptively with information overload” or of the important place held by the mass media, the significance of their goals, principles and practices.

However, these issues cannot be dealt with without some indications of the trends and possibilities and implications of satellite communication in the light of more clearly defined aspects. The implications may be seen from various points over view such as in response to such questions as to what kind of information can be or need be transmitted over satellites, according to what patterns, by whom, and for what purpose, in which context. The introduction of satellite communication occurs in widely different socio-economic, political and cultural contexts. The implications will, therefore, vary from country to country and region to region. One of the basic differences will be between those countries already possessing a well developed telecommunications and broadcasting network and nations with limited, inadequate facilities where geographical and other factors add to the difficulties in establishing nationwide net works. These two categories would generally but not completely correspond to the industrialised and developing areas of the world.

It has been said that satellite technology would be particularly unsuited to developing countries because it is expensive, technologically sophisticated and presents new problems when the present ones have not been solved. While admittedly the cost factor is an essential consideration, the scale of expenditure should not distract from an evaluation in terms of development goals that can be served in this way and in some cases in no other way. Moreover, the satellite system costs have fallen low enough to be within reach of developing countries, and to represent at least an option that should seriously be taken into account.

It has been recognised in various international bodies, primarily in the United Nations, that all efforts should be made to assist developing nations to benefit from space technology. It has been emphasized that if the developing countries continue to rely upon traditional, conventional techniques without taking the plunge into new technology, the gap between them and the technologically advanced countries will not close but continue to widen.

“Several peaceful applications of outer space can be applied now in developing countries to provide a new stimulus for progress. Above all, it is necessary to ensure that they are not compelled to follow through the same steps as were taken during the past century by those countries which are technologically advanced today. Many traditional technologies become much more cost effective if combined with space applications. The population explosion and the rapidly shrinking world do not permit delaying the benefits arising from space until the older methods have been developed. The question is not whether developing countries can afford the peaceful uses of outer space. Rather it is whether they can afford to ignore them”.

Another great inequality in today’s world, that must be overcome, lies in the disparity between the urban centre’s and the rural areas, which is particularly evident in the case of information and communication media. Traditionally, they are first established in the cities from where they slowly, if at all, penetrate the countryside. Terrestrial telecommunication and television networks almost never achieve full coverage. Therefore, “until the advent of space technology, many benefits of a modern society were available only to communities residing in large metropolitan areas or to those linearly connected to such areas. Through communication satellites, it is now possible to reach isolated communities dispersed over a large region without suffering economic penalty. This aspect of space technology is of particular significance to developing countries where agriculture plays a preponderant role and substantial sections of the population are non-urban with a low level of literacy.

“Education as well as information inputs which might contribute to motivation for modernisation, the use of new techniques in the production of food, improved health and sanitation, can all be provided much more readily if reliable audio-visual communication link can be established nation-wide. Moreover, many developing countries face an acute problem arising from social force of disintegration. Their continued viability is dependent on the integration of many religious, tribal, and regional groups which have distinct cultural and political traditions. A single system of mass communications providing a common-shared experience to the entire population can perform an important role in making credible the oneness of the territory.”