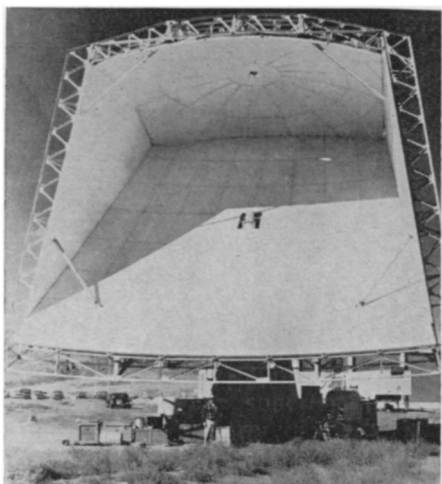


Plum in the sky



COMSAT

Comsat antenna: Many rival systems.

The ownership of geosynchronous satellite systems for the relay of telecommunications across America and to all of its 50 states has been the subject of heated discussion among potential operators, trade associations and Federal agencies since the mid-1960's.

Despite the availability of all necessary technology for ground and spaceborne components and a plethora of private capital, the only significant decision so far to implement such a system was made by the Nixon Administration last February: a recommendation to the Federal Communications Commission that an open competition be held for all interested parties.

Previously, many had held the view that the Communications Satellite Act of 1962, establishing the Communications Satellite Corporation as a publicly owned quasi-governmental utility, automatically chartered that firm to develop and operate all such space-relay systems for the United States. Inevitably this contention was challenged by major users and carriers of long-range communications. The latter argument won out, but the country still does not have a system authorized.

Approval of a system or even of several systems may be in the offing. The FCC set Aug. 19 as the cutoff date for all initial proposers to make known their intention to file a system application. The first was Western Union on July 30; several more were expected because more than 30 preliminary system proposals have been filed with the FCC during the past four years. The FCC has emphasized, however, that applications may be tendered at any time in the future "for frequencies and orbital locations which are not preempted by the initial applications."

Latecomers, it should be pointed

out, may find their delay could degrade the operational characteristics of systems because there will be only a finite number of optimum orbital sites and choice frequencies available in the radio spectrum (without moving upward into the millimeter wave region).

The demand is growing for a variety of satellite relay systems for two principal reasons: A system owned and operated by the user could sidestep the steadily increasing annual fees now going to the common carriers (data transmission rates, for example, were doubled by American Telephone & Telegraph Co. last February) and the very-high altitude of relay satellites offers a better means to communicate in some applications, such as for long-range voice links for commercial aviation that today experience frequent interference and even loss of signal.

There are other factors. Through the National Aeronautics and Space Administration programs and the operation of the international communications satellite network by COMSAT, considerable experience has been amassed in this field. Large launch vehicles are now available capable of carrying a variety of payloads, and many small thrusters and attitude control systems are developed to allow spacecraft spatial maneuvers in orbit. Microelectronic advances now permit the construction of very-high capacity satellites with 10,000 or more circuits, and an operational life of more than five years.

Finally, there is another factor that has opened up the list of potential users. Recent rulings by the FCC have authorized the establishment by non-common carriers of data communications networks. Since these specialized services, largely intended to interconnect computer facilities, are free of Government regulation, AT&T is specifically barred from participating in such services and other regulated common carriers would be required to form separate subsidiaries to engage in computer-data handling.

Development and installation of a major orbital system and its supporting ground network is not for the faint hearted—it is a costly business with initial expenditures estimated as high as \$300 million and annual operating costs at \$40 million to \$55 million. But the returns can be impressive. The major broadcasting networks this year will pay AT&T some \$70 million to carry their programs to affiliates around the nation, for example.

A recently concluded study performed by Page Communication Engineers, Inc., in Washington, D.C., for ABC, CBS and NBC and the Corporation for Public Broadcasting probably will result in a consortium of these companies to build and operate a joint system.

Page estimates show that either a three-satellite relay system or a ground microwave transmission system could serve up to 12 color TV programs at a time plus providing another 8,000 to 9,000 circuits for regular TV, radio and data for about \$55 million annually.

The networks are expected to favor the satellite approach because of lower long-term maintenance needs and an expected decline in satellite costs per channel.

As early as 1966, COMSAT, AT&T and the Ford Foundation filed proposals with the FCC calling for similar systems, although Ford confined its concept to the needs of educational TV. COMSAT and AT&T plans called for growth systems designed to meet commercial telecommunications requirements up to the mid-1970's.

For example, COMSAT's 1973-model system would employ four satellites providing up to 96 color TV channels or up to 168,000 trunk voice-grade channels. The AT&T system of the same period would provide 83,000 voice circuits or up to 27 color TV channels.

The INTELSAT IV advanced communications satellite, now under development for COMSAT by Hughes Aircraft Co., El Segundo, Calif., will have a capacity for 6,000 two-way phone circuits or 12 color TV channels.

The great strides made in microelectronics during the past four years should make even higher satellite capacities possible. The recent Western Union proposal calls for a three-satellite system, but one would serve as back-up. Total capacity planned is 9,000 circuits plus 10 video channels. The firm estimates initial cost at \$95 million and operating expenses of only \$10 million. The annual return: \$28 million.

A General Electric Co. concept would establish a business-to-business communications network throughout the country. GE believes that such a system could offer high speed exchange of data between firms or between widespread elements of the same company at a greatly reduced cost.

Even publishers have gotten into the act. In 1968 McCall Corp. sought from the FCC the right to exclusive use of one color TV channel of a domestic broadcast satellite system. This would be used, said McCall president Henry E. Bowes, for a "magazine of the air" to be transmitted to selected audiences, presumably on a subscription basis. Bowes also noted his firm's interest in satellite use for transmitting computer data and for the interchange of copy between publisher and printer.

All these projects must now await authorization by the FCC. Whenever the okay is given, several years will be needed to develop each system. □