Intelsat: Flying High, but Future Course Uncertain

Nationalism has been the Space Age's most powerful fuel. The United States and the Soviet Union have bid for the honors, while the Europeans have watched enviously from the sidelines. International communications satellites have been a partial exception to this rule. In 1964, 11 nations signed an agreement organizing Intelsat (the International Telecommunications Satellite Consortium) to create a global satellite communications system. That agreement was always intended to be temporary; Intelsat's expanded membership (now 68) has just completed a month-long meeting at the U.S. State Department in Washington in an attempt to write a permanent agreement.

This it did not do. After a month of meetings, the major participants—the United States and most of the major European nations—were still far apart on some very fundamental issues. In the absence of consensus, the convocation might easily be written off as a failure. Nothing could be further from the truth.

More Channels, Lower Costs

In fact, the conference made it clear that Intelsat, in its brief 5-year history, has been an extraordinary success. Intelsat now has satellites operating over the Atlantic and the Pacific. These satellites, which primarily transmit voice telephone signals, have had at least two important consequences.

First, they have tended to depress the cost of transoceanic communications. Before the satellites were in operation, underseas cables provided the most efficient means of intercontinental communications. But the number of cables was limited. Having satellites over the Atlantic has multiplied the number of available channels and has put pressure on all the carriers to lower their rates. Since 1965, transatlantic rates have been nearly halved.

Second (and probably more important), the satellites have given the nations of the "third world" a chance to join the advanced world's communications system.

Most of the Asian, African, and Latin American countries were (and still are) dependent on a confused mixture of radio and cable channels for their communication with the outside world. Traditionally, calls in and out of these countries have been expensive and have involved long waits. Cables are concentrated along the lines of greatest traffic—between the United States and Europe and between the United States and Japan—and conversation has been possible only between the two points at the ends of the cable; messages to places beyond that have had to be relayed by microwave, radio, or overland lines.

Satellites provide "point-to-point" communication; in other words, any two points can communicate via satellite as long as each of them has an adequate sending-receiving earth station. To date, 23 such stations have been constructed, and more than 20 others are now under construction or to be built in the immediate future. Such a station costs between $3 and $5 million, a relatively small price to pay for the ability to plug into a first-rate communications system. (Moreover, for the poorer countries, long-term credits can be arranged to help with station financing.)

Soon Intelsat will put a satellite over the Indian Ocean. This will give the system worldwide coverage. And it is in this context of achievement that the conference must be considered: no one lambasted Intelstat or seriously proposed that it be disbanded; everyone was fundamentally pleased with the accomplishments of the last 5 years.

One sure sign of this success was the presence of representatives of the Soviet Union at the Washington conference as official "observers." The Soviets have proposed a nominally competitive worldwide system, called Intersputnik, and they and their Eastern European allies are Intelsat's most conspicuous nonmembers (aside from China, of course). The attendance of the Soviet delegates in Washington, some think, foreshadows a decision to join Intelsat—either as full-fledged members or simply as "users." Throughout the conference the Soviet delegates listened attentively; they made some short remarks, but gave little indication of what they plan ultimately to do.

Their decision may actually hinge on what Intelsat's own members decide to do with the organization. For, though everyone was pleased with the results to date, there were serious disagreements about the future. At issue is Intelsat's formal structure; the essence of the problem is determining how large a role the United States should play.

In many respects Intelsat was a U.S. creation. The United States took the initiative in convening, in 1964, the conference which drafted the original agreement for the international consortium. But American domination stemmed not from its political position but from its economic and technological power.

Synchronous Satellites

Intelsat, in effect, depended upon U.S. know-how in space technology. For example, Intelsat decided early to place its satellites in synchronous orbit —about 24,000 miles up—so that the satellites would rotate at the same speed as the earth and, thus, appear stationary to any point on the earth. This approach promised large rewards; earth stations could be less sophisticated and less expensive because they would not have to track a moving satellite. But synchronous satellites also meant large, sophisticated rockets which could place big payloads in high orbits, and only the United States had these. In addition, the United States was well ahead in satellite design technology. All this made it not only inevitable but—from everyone's vantage point—also desirable that the United States take the lead.

Under the 1964 agreement, the United States received the major role. A U.S. firm, Comsat (the Communications Satellite Corporation), was given the job of "manager" of Intelsat; this meant that Comsat was to oversee the design of Intelsat's satellites, contract with NASA for launching them, and supervise their operation once they were in space.

The second source of U.S. control was its voting strength as a member of Intelsat's governing body. Votes were apportioned according to investment; because more than half the investment was U.S. money, the United States had more than half the votes. According to the way the agreement was written, the United States could theoretically

decide all major issues if it won the support of nations with only 12.5 percent of the vote.

This system of decision making may seem strange for an international organization. In fact, Intelsat was never supposed to be simply an international organization; it was supposed to be also a commercial organization, providing communications services for member countries. Run in an efficient, business-like manner, it would concentrate on achieving rapid, sound results. The dividends for international cooperation would be mainly the achievements themselves (better communications, transoceanic television, and so on) rather than the process of achieving.

Looked at abstractly, then, the U.S. domination is almost absolute. Comsat was the American representative on the governing board; Comsat was also the "manager." Because the American vote was more than 50 percent, Comsat could, in effect, give itself orders. Americans involved with Intelsat say this control was more theoretical than real. In a cooperative international group, they say, most decisions, to be effective, must have a wide base of support; thus Intelsat's governing body almost always acted on a unanimous—or near unanimous—recommendation.

Be that as it may, the Europeans clearly see a difference between the agreement arrived at in 1964 and the one that the recent conference was supposed to make: the first was temporary, the second would not be. The Europeans want an end to Comsat's role as "manager" and reduction of the U.S. voting power.

This desire, though it certainly involves motives of pride and prestige, also raises (once again) the question of the "technology gap." Advanced communications technology—specifically, satellite communication technology—is likely to be important for a long time to come. The Europeans, closest to being American rivals, do not want to see the control of that technology centralized forever at Comsat. Comsat, they emphasize, has its own corporate interests to pursue. There is some (though not universal) suspicion that those interests and Intelsat's interests may not always be identical.

Just how this conflict will be resolved is unclear. In a month of meetings at the State Department, the participating nations did not arrive at even a draft agreement. Many delegates foresaw this deadlock: a large international conference, they said, is not the best place to make compromises over sensitive issues.

There does seem to be some common ground. The Europeans do not suggest that Comsat be abruptly divested of all its Intelsat work. Far from it. Comsat today is the expert in the field; no one wants to jeopardize Intelsat's success by disrupting the practices of the last 5 years. What the Europeans want is to make sure that Intelsat's institutional arrangements allow ultimately for greater contributions from others. An international secretariat would replace Comsat as Intelsat's "manager," and technical tasks would be subcontracted by this secretariat. Comsat would receive the bulk of the early work, and other organizations would benefit only as they demonstrated genuine competence.

Later this spring, a working group of participant nations will reconvene in Washington to restudy the problems. Then, in November, the full conference is expected to reassemble to debate actual draft documents prepared by this smaller group.

The U.S. approach is to raise the banner of pragmatism. Intelsat has worked, so why tamper with a successful formula? The fundamental issue lies deeper. Technological superiority, no less than economic or military superiority, creates its own foreign policy problems. America's Intelsat partners are pushing for a Space Age which—if not truly international—is at least more multinational.

—ROBERT J. SAMUELSON

Robert J. Samuelson, a former Science *news intern, is now a* Washington Post *reporter.*

APPOINTMENTS

In the Department of the Interior, **Donald D. Dunlop**, president of Creative Enterprises International and president of Production Research Corporation, to assistant to the secretary and science adviser; **Hollis M. Dole**, director of the State of Oregon Department of Geology and Mineral Resources, to assistant secretary for mineral resources; and **Leslie L. Glasgow**, professor of wildlife management at Louisiana State University and director of the Louisiana Wildlife and Fisheries Commission, to assistant secretary for fish and wildlife and parks and marine resources. . . . **Paul D. Carter**, vice provost of Columbia University, to provost of the university. . . . **Robert G. Paar**, professor of chemistry at Johns Hopkins University, to chairman of the department of chemistry.

RECENT DEATHS

Henry D. Brainerd, 54; William Watt Kerr professor of clinical medicine at the University of California, San Francisco Medical Center; 18 March.

John W. M. Bunker, 82; former dean of the Graduate School at the Massachusetts Institute of Technology; 21 March.

James H. Harrold, 44; chairman of the physics department at Kenyon College; 15 March.

Stanley Johnston, 70; professor of horticulture at Michigan State University and superintendent of the university's South Haven Agricultural Experiment Station; 11 March.

Beverly W. Kunkel, 87; former professor of biology at Lafayette College; 6 March.

Alexander Lebedev, 75; member of the Academy of Sciences and one of Russia's top physicists.

Robert C. Lewis, 81; dean emeritus and emeritus professor of biochemistry of the University of Colorado School of Medicine; 23 February.

Jack Masur, 59; assistant surgeon general of the U.S. Public Health Service and chief developer and director of the Clinical Center of the National Institutes of Health; 8 March.

Hugh T. O'Neill, 74; former professor of biology at Catholic University; 7 March.

Sadao Otani, 75; emeritus professor of pathology at the Mount Sinai School of Medicine; 7 March.

David L. Patrick, 69; coordinator of research and vice president for academic affairs at the University of Arizona; 14 March.

Lewis C. Scheffey, 75; emeritus professor of obstetrics and gynecology at Jefferson Medical College; 13 March.

John K. Wright, 78; former director of the American Geographical Society; 24 March.

Erratum: In the report, "Spectra, variability, size, and polarization of H_2O microwave emission sources in the galaxy" by S. H. Knowles *et al.* (7 Mar., p. 1055), the antenna temperature scale for the Orion spectrum in Fig. 2 is in error by a factor of 2. The correct scale is 0 to 500 rather than 0 to 1000 as shown. The antenna temperature scales for the other spectra in Fig. 2 and for those in Fig. 1 are correct as shown.