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## U.S. DOMSAT POLICY: A CASE STUDY OF ECONOMIC CONSTRAINTS ON TECHNOLOGY ASSESSMENT

Economic limitations in the process of technology assessment are analysed on the example of the U.S. system of domestic telecommunication satellites.

As man becomes ever more dependent upon technology for the attainment of his ever more far-reaching goals, it becomes imperative that any new technology be carefully assessed as to its consequences before it is added irrevocably to the complex machinery of human progress. What if such an assessment shows, however, that the only major objection to a proposed new technology is that it would diminish the importance of an older technology and of those interests and institutions which have depended upon it? This, in a word, is the issue faced in recent years by the United States government as it groped towards policy with regard to domestic use of **communications satellite** ("comsat") technology.

The history of this policy formulation might be cited to show that a regulatory agency is ill-equipped to plan for the future because it cannot see clearly over the shoulders of the corporate giants that it is expected to regulate. But it can also be cited to show that not even corporate giants can exclude a major technological innovation indefinitely. Whether the synthesis that emerges out of this dialectic of dollars deserves to be called technology assessment depends, perhaps, on what level of consciousness one expects of governmental decision-making. It is, therefore, for the reader to determine from what follows if the U.S. government's assessment of **domestic satellite** ("domsat") technology has been any more than a belated confirmation of that almost forgotten doctrine of the invisible hand.

In a word, comsat technology is on the verge of effecting significant changes in the structure and operation of the American telecommunications industry. If

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such changes do come about, however, this will be due not to any textbook-model enlightened public policy opting instinctively for a superior technology, but to a classic case of governmentally refereed economic natural selection. By all traditional standards of corporate worth, notably that of total assets, the combatant most fit so survive the sorting out process would unquestionably be "the phone company", American Telephone & Telegraph, Inc. (AT&T). This government created and sustained multi-billion dollar communications monopoly was on the scene "the firstest with the mostest", and has defended the resulting prerogatives most adamantly throughout what now can be called the first phase of a transition to radically different technology. What is already clear, however, is that the company that lays cable on land has not succeeded — at least, not yet — in suppressing or swallowing others whose expertise consists of moving information to and from high in the sky.

That AT&T has not succeeded in eliminating all potential competition is not, as we shall see, because it has not tried, but because it has been constrained — partly by the power of some of its competitors (e.g., RCA and IBM), partly by statute (e.g., those establishing NASA and the Communications Satellite Corporation), and partly by government agency regulation. The regulator in this instance is the Federal Communications Commission (FCC), which, with the help of its overworked and underfunded Common Carrier Bureau, has been carefully stepping its way through political, economic, and legal minefields from a position of safeguarding the old to one of at least finding a place for the new.

The fibre for this gradual shift in policy may be said to have been woven from three stands: 1. the international strand, which took shape in the Communications Satellite Act of 1962 and its progeny, Comsat and INTELSAT, and achieved stability in definitive arrangements entered into in 1971; 2. the domestic policy development strand, which may be said to have begun with the Communications Act of 1934, but which took off with a serious domsat application in 1965 that led five years later to a "multiple entry" policy for the domsat industry; and 3. the domestic policy implementation strand, which began with conservative ad hoc decisions — or, arguably, non-decisions — at the outset of the comsat era in 1957, but has become somewhat more imaginative and experimental since 1972. Each of these strands will be considered, but the main focus will be on the development of domestic policy.

## 1. The world traveler

In the context of our consideration of domsat policy, what is most important to note about the Communications Satellite Act of 1962 is that it was enacted to lay a foundation for American **global** dominance in electronic communications. Five years had gone by since the first Russian sputnik; but, in the wake of the initial U.S. sub-orbital and orbital astronautical successes, AT&T's Telstar I, a comsat capable of carrying television, had just been launched into orbit. Once challenged

by this exhilarating evidence of an imminent opportunity to beat the Russians at their own electronic game, hard-nosed practical concerns about proposed structural arrangements for satellite exploitation lost any chance of being persuasive in Congress. But in retrospect these concerns were by no means inconsequential.

Reduced to essentials, the one key issue before Congress with regard to comsats was how best to structure arrangements to assure their reasonably expeditious development and utilization in a global network. In other words, all parties to the debate agreed on the global goal but differed as to the preferred instrumentality for its attainment. From the outset the majority favored a private entity, to be known as the Communications Satellite Corporation (or "Comsat"), that would remain subject to federal, i.e., principally FCC, regulation. Among themselves the majority differed as to the extent to which common carriers, especially AT&T, might own stock in and elect directors to the board of the new corporation. Opponents, fearing that stockholding common carriers with vested interests in their own terrestrial systems, e.g., transoceanic cables, would frustrate any competitive exploitation of satellites and that the FCC would be unable to counteract such domination, favored an entirely government owned and operated entity. Compromise provisions eventually enacted into law limited the amount of Comsat stock which common carriers could own either individually or collectively.

Underlying these weighty policy considerations, of course, was the question of fair allocation of contracts in connection with comsat research and development. The minority, in particular, argued that the FCC's past inability to regulate AT&T's telephone rates established a presumption that it would be no more effective in guarding the public interest with regard to satellite communications. What, they asked, is to prevent AT&T from pursuing past policies through assignment of all Comsat procurements to its subsidiary, Western Electric? To this sort of objection, the Justice Department replied that dissatisfaction with the regulator is best cured by either improving it internally or reassigning its responsibilities to another agency.

The international effort proceeded rapidly if not always smoothly. In a matter of months after the statute was enacted, Comsat was organized (February 1963), and a year later interim arrangements set up the International Telecommunications Satellite Organization (INTELSAT), with Comsat as its manager. The following year, 1965, the world's first commercial satellite, INTELSAT I, was launched and single-path telecommunications service between the United States and Europe was inaugurated. This particular satellite had a design lifetime of 1.5 years, primary power of 40 watts, a total bandwidth of 50 MHz, and a capacity to carry the equivalent of 240 telephone circuits. Additional comsats of first the same and then of increasingly greater capacity were launched in the years that followed, always with FCC authorization, until today the earth is covered by eight fourth generation synchronous orbit satellites each of which has a design lifetime of 7 years, primary power of 400 watts, a total bandwidth of 500 MHz, and a capacity to carry the equivalent of 4000 telephone circuits over 500 paths in 80 different countries.

This new enterprise in the sky created a considerable variety of legal problems, not the least of which were in the area of international law. Numerous conferences,

held under both official and unofficial auspices, attempted to deal with questions ranging from frequency allocation to limitations on the content and destination of programs beamed across national borders. With regard to the latter, various writers became especially attentive to the possible ramifications of direct broadcasting from satellites (DBS), a now attainable technology whereby programs would be beamed from a satellite directly to home receivers without the intermediary of any regional or local earth station. And by 1980 one would need to add into the mix the expanded versatility, power and longevity of satellites made possible by the introduction of space shuttles.

In any event, it was already clear by the mid-1960's that satellites were here to stay, and businessmen were already envisioning domestic applications of the new technology. As this latter interest spread among the various competitors in the electronics industry, the FCC would soon find itself in the center of a battle for some or all of the anticipated market. The fundamental reason for the FCC's embattled position — apart, that is, from the economic spoils at issue — is that the 1962 legislation envisioned only a single global comsat system, to which existing international common carriers were expected to be connected. Thus, the 1962 act calls upon the President of the United States to

so exercise his authority to help attain coordinated and efficient use of the electromagnetic spectrum and the technical compatibility of the system with existing communications facilities both in the United States and abroad<sup>1</sup>.

And the FCC, in turn, is required by the same act to exercise its authority under the Communications Act of 1934 in such a way as to

insure that facilities of the communications satellite system and satellite terminal stations are technically compatible and interconnected operationally with each other and with existing communications facilities<sup>2</sup>.

In other words, in the face of a revolutionary new technology that might well transform the entire structure of the telecommunications industry, the executive branch is mandated by statute to safeguard the prerogatives, and incidentally the investments, of the old technology.

On its face, this statutory language simply embodied the viewpoint of, in particular, AT&T that the principal and even exclusive function of the satellite system would be to extend congenially the capabilities of the terrestrial system already in place. But, on the other hand, the language could also be read in the context of the 1962 act as a whole as referring only to the global system, while remaining silent about policies with regard to an alternative domestic system which was simply not envisioned by lawmakers in 1962. In any event, domestic applications were imminent, and statutory law was silent about them. What considerations, then, were to guide the FCC in its search for "the public interest, convenience or necessity"?

<sup>1</sup> Communications Satellite Act of 1962, 47 U.S.C. § 721 (a) (7).

<sup>2</sup> Id. at § 721 (c) (4).

## 2. Homecoming preparations

Not surprisingly, in view of its earlier record with regard to microwave, the FCC at first adopted a policy of protecting the vested interests of common carriers, in accordance with the view of AT&T that comsats were simply "cables in the sky". This curious analogy did make some sense when applied to a multiunit/random orbit/medium altitude system, of which AT&T's TELSTAR (1962) was an example. But Hughes Aircraft soon proved with its SATCOM series (1963), used to beam the Japanese Olympics (1964), and then with INTELSAT I (1965), that an incomparably superior synchronous (high altitude/stationary orbit) system was feasible. This historical achievement in effect made then existing terrestrial systems obsolescent, and marked the beginning of a new era in communications technology. Within a year the Soviet Union would have its powerful Molnya ("lightning") system underway; then in the early 1970's would come domsats for Great Britain, Italy, Western Europe, India, Latin American, Indonesia, and Canada; and others (e.g., for Japan) are on the way. The Canadian system, built as were others by Hughes Aircraft and called ANIK, became operational in 1972, just in time to be available on a temporary basis for American firms that would only then be permitted to get into the act.

As abroad so also at home, the advent of the synchronous system brought forth customers for satellite services who could readily see their use as a significantly less expensive alternative to land routes on which they had theretofore been dependent. And thus began the FCC's beleaguered quest for the public interest with regard to domestic use of communications satellites.

The first petitions merely sought access to the newly emerging INTELSAT system, but even these had to be handled rather carefully. A group of common carriers was allowed to obtain from AT&T facilities to bring TV service from the Andover, Maine, earth station. Comsat was granted temporary authorization to provide television transmission services to the major networks. But a subsequent petition to make that authorization permanent was denied. That refusal was then solidified in a decision which held Comsat to be principally "a common carrier's common carrier", which accordingly could serve non-common carriers, notably networks, only in "unique" and "exceptional" circumstances. Petitioner's insistence that such direct satellite service would be much more economical was viewed by the Commission not as triggering a statutory obligation on its part to effect rate reductions made possible because of satellites but rather to head off any threat to "the conventional carriers". This position the Commission bolstered with appeals to the legislative history of the 1962 act.

These and other like early decisions were probably very proper interpretations of the global intent of the Communications Satellite Act of 1962. But when the American Broadcasting Company came to the FCC on September 21, 1965, with a proposal developed by Hughes Aircraft to build what Commission bureaucratise would at first call "domestic non-common carrier communications satellite facilities by nongovernmental entities," the issue moved into a statutory no-man's land.

The ABC petition sought authorization to beam television programs to all fifty states off a synchronous satellite from transmitting earth stations near New York and Los Angeles that would provide free access to public broadcasters. Comsat, in response, claimed an invasion of its hegemony. So the FCC called for help, on March 22, 1966, with a Notice of Inquiry, to which was added a Supplemental Notice of Inquiry regarding technical questions, that would occupy its attention for years to come as Docket 16495.

In response to this "inquiry into legal, policy and technical questions relating to the possible establishment of satellite systems for domestic use," nineteen parties filed proposals and/or comments before the last of several deadlines on April 3, 1967. Among the early proposals submitted was one from the Ford Foundation, later generally endorsed by a special Carnegie Commission Report, to let NASA do a pilot program to demonstrate the value of domsats for public broadcasting. Comsat thereupon added to its input a hastily prepared stop-gap proposal to launch such a demonstration satellite itself. A more radical proposal, favored by aerospace manufacturers and broadcasting networks, called for a high-wattage DBS system that would bypass all ground stations to deliver national programs without intermediary to home receivers. Common carrier like AT&T, and originally Comsat as well, proposed instead low-power multi-purpose satellites that would remain dependent on extensive ground systems.

A key proponent of DBS at the time was then chairman of RCA (owner of NBC), David Sarnoff. But neither RCA's DBS plan nor others from General Electric and Hughes Aircraft were given any real encouragement for domestic purposes then or since. The reasons for such concerted disregard, as articulated by Lawrence Lessing in 1967, seem economically overwhelming:

The big common carriers have literally no use for direct-broadcasting techniques. The National Association of Broadcasters, representing largely local-station owners, is obviously against any system that might cut down its members' stations. And owners of ... CATV systems are cool toward any system that could eventually wipe out the need for their services<sup>3</sup>.

Given this broad-based opposition to a DBS system, the only viable question was what alternative system or systems, if any, should be approved. The Ford Foundation proposal, first of all, was neatly side-tracked by the Public Broadcasting Act of 1967, which innocuously allows for, without requiring, "free or reduced rate communications interconnection services" for educational radio or television, subject to FCC rules and regulations. As pressure mounted from Comsat's international partners in INTELSAT for less U.S. domination of that system, President Lyndon Johnson, in a message to Congress dated August 14, 1967, reaffirmed U.S. commitment to INTELSAT, but noted that the INTELSAT agreements "do not preclude the development and operation of satellite systems to meet unique national needs", and accordingly appointed a Task Force to study how and in what time frame a domsat system compatible with INTELSAT might be established.

As the public's attention was focused, often enough via live television, on perhaps

<sup>3</sup> Lessing, "Cinderella in the Sky", 21 FED. COM. B.J. 92, 100-101 (1967).

its most turbulent presidential election year in history, the Task Force, chaired by Eugene Rostow, put together a report that came down foursquare in favor of every major position of Comsat and the common carriers, especially AT&T. Insisting that "systemic flexibility should be a continuing underlying philosophy of industry regulation", the Task Force recommended "as the most prudent course a modest operational pilot domestic satellite program, with Comsat playing the leading role." Noting in addition both the technical problems involved in transmitting satellite signals to and from an urban area where landline microwave routes converge (a concern now known to have been greatly exaggerated) and "the declining cost of coaxial cable facilities," the Task Force seemed prepared in effect to let satellites and microwave systems fight it out, then let the winner (possibly neither of the combatants) indemnify the loser or losers. Yet as between the satellite and terrestrial technology it would somehow want to allow "the natural advantages of each to be sought, developed and put into service."

This cautious restraint on the part of the Johnson Administration was simply disregarded after Richard M. Nixon came to power in 1968. By 1970 this new Administration announced itself in favor of an "open entry" policy that would implement laissez-faire economic doctrine. In the interest of stimulating rather than frustrating competition, the Nixon White House called for "a diversity of multiple-satellite systems as well as multiple-earth stations" in order "to provide a full range of domestic services." To this end it recommended adopting certain guidelines on a 3-5 year interim basis. These guidelines would establish an "open-entry" policy limited only by technical, international and military considerations. In the interest of greater flexibility, they would allow for arrangements that could be both public and/or private, independent or cooperative, specialized and/or common carrier, terrestrial and/or satellite. The Nixon White House also adopted the 1968 Task Force concept of indemnification by allowing for reallocation of spectrum subject only to compensation by "the new entrant" of "the established users."

Thus apprised of its marching orders from the new Administration, the FCC two months later announced a policy that was undoubtedly very different from what it had formulated the year before. In particular, the Commission declared that it still could not determine whether a U.S. domsat program should allow for multi-purpose or specialized systems, or a combination of systems, or should be arrived at on the basis of the Administration-proposed open entry policy. It therefore announced that it would proceed on an ad hoc basis and make its determinations in the context of concrete proposals. Without guaranteeing authorization of any particular proposal, the Commission noted that it would be guided by statutory and judicial authority. Potential applicants were advised to take into account the plans of other countries, to avoid orbital space problems and possible electrical interference.

One additional issue that the FCC resolved, almost off-handedly, was the question of its legal authority over domestic satellites. The carriers had argued generally that authorization of non-carrier entities would be illegal or, in the alternative, bad policy. Non-carriers generally had disavowed such legal barriers. In this instance,

the FCC found itself in agreement with the non-carriers; but it had to work its way through some statutory lacunae and ambiguities to arrive at this conclusion.

The problem, essentially, is that the Communications Act of 1934 says nothing about satellites and the Communications Satellite Act of 1962 says nothing about domestic satellites. The solution which the Commission adopts is to show that the 1934 act, as interpreted judicially, points to FCC assumption of such jurisdiction and that the 1962 act, as perceived in its legislative history, does not preclude such jurisdiction. On the basis of this line of reasoning the Commission concluded that it may authorize domestic communications satellite facilities upon finding that such facilities would serve the public convenience, interest or necessity under the 1934 act and are required in the national interest under the 1962 act<sup>4</sup>.

Having thus assured itself of its authority to regulate domsats, the Commission proceeded to set forth not a comprehensive policy but an assertion that satellites could "play an important role in the field of domestic communications" and that accordingly the FCC stood ready to consider "concrete system proposals" from any qualified applicant. With these few words the Commission abandoned the go-slow policy of the Johnson Administration. But it did not swallow whole the laissez-faire marketplace approach the new Administration had recommended. Applicants would need to be "legally, technically, and financially qualified entities." The precise structure of an entity which would be thus qualified was not, however, to be narrowly predetermined, nor was the manner in which it would deliver satellite services. Moreover, the Commission noted, a carrier of domestic satellite services would, unlike their international counterparts, be able to deal directly with customers for its services.

### 3. Ecce Domsat!

The impact of this 1970 invitation for satellite applications was quickly discernible. During the four fiscal years from 1967 to 1970 inclusive the FCC received a total of 110, or an annual average of 27, satellite-related common carrier applications. followed by another 38 the following year and 103 the year after.

Among the applications approved were some which eventually led to the establishment in orbit of three domsat systems, Western Union's WESTAR, RCA's SATCOM, and Comsat's COMSTAR, channels on which are leased to AT&T. In addition to these, Canada's ANIK is available, and has been used temporarily by American domsat enterprises especially during their start-up phases. And, finally,

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<sup>4</sup> Domestic Communications-Satellite Facilities, Report and Order, 22 FCC 2d 86, 133 (1970).



the FCC has just recently approved plans for a data transmission satellite system developed by Satellite Business Systems, Inc., a joint enterprise involving Comsat, IBM and Aetna Casualty Insurance Co. The availability of satellites, in turn, has brought about the construction of numerous earth facilities needed to use them, including now over a hundred receive-only earth stations being used mainly for transmission of televised programs to cable systems. And as satellite technology advances, especially in terms of the power and precision of the satellites themselves, ever smaller receiving antennas on earth become feasible. And, accordingly, the FCC has recently authorized the use of receivers with antenna as small as 4.5 meters. Thus is technology moving us by its own inner logic to the very edge of that DBS approach to broadcasting so coldly received in this country in the 1960's.

That we have come this far since 1970 is not, however, received everywhere with unmitigated delight. In fact, the traditional common carriers, meaning especially AT&T, view the trend with alarm; and, as we shall see, they have every intention of blocking its competitive implications, for which they hold the FCC singularly responsible. To complete this historical overview, then, we should at least briefly consider the FCC's domsat decisions since "multiple entry" first became policy in 1970.

Following its announcement of policy in 1970, the Commission received a number of applications for proposed services ranging from long-distance message circuits and leased lines for voice and data to the transmission of television programs to earth stations at or near broadcasting stations; the transmission of TV programs directly to CATV headends, of motion pictures to movie houses, as well as MAIL-GRAM, PICTUREPHONE, educational and instructional television. These proposals, taken collectively, called for a total of "600 in-orbit transponders, of which 336 would be primary and the rest spare." The FCC's Common Carrier Bureau reviewed the applications "with assistance of experts from the Goddard Space Flight Center of NASA", and subsequently recommended limiting "open entry" by requiring that proposals involving the same or similar satellite technology be consolidated unless strong public interest grounds to the contrary could be shown.

A principal concern of the staff was how to regulate entry in such a way as to facilitate innovation, on the one hand, while, on the other hand, preventing AT&T monopolization. Satellite technology is obviously useful for telephone communications; but if the Bell were allowed to ring beyond that sphere it could easily head off any serious competition. For, as of 1970,

AT&T's total annual revenues exceed \$18 billion and are growing at an annual rate of more than 10 percent. About 30 percent of its total revenues, or \$6 billion, is derived from interstate services. Of this amount, some 85 percent is produced by services which AT&T provides without any competition, principally message toll telephone [MTT] and wide area telephone service [WATS] services. On the other hand, 15 percent or \$900,000,000 are derived from non-message services, most of which may be offered by competing entities under the *Specialized Carrier* decision in Docket No. 18920<sup>5</sup>.

<sup>5</sup> Domestic Communications-Satellite Facilities, Memorandum Opinion and Order, 34 FCC 2d 1, 52 (1972).

**Specialized Carrier**, following shortly after the **Carter-phone** decision, is a landmark ruling in which the FCC excluded peripheral instrumentalities from AT&T's monopoly control over terrestrial services and left it up to "competitive entry" into the marketplace to determine which systems customers would use. That decision, however, explicitly excluded communications satellites pending the establishment of policy in Docket No. 16495. In the judgment of the Common Carrier Bureau, the situation with regard to satellites was clearly distinguishable from **Specialized Carrier's** rationale, because the public could be harmed by failure of satellite services and by the strong possibility that only AT&T would survive unregulated competition.

After hearing oral argument in May 1972, the FCC gave to its 1970 "multiple entry" policy some structure and direction in light of the responses, including that of the staff, to that policy. Now, however, the Commission went on record as not only being open to applications but as being prepared actively to encourage development of the new technology by facilitating opportunities to gather data about it and demonstrate its advantages over terrestrial systems. While remaining flexible in its policy, the Commission would nonetheless "facilitate the efficient development of this new resource by removing or neutralizing existing institutional restraints or inhibitions."

The words here quoted, although exceptionally ambiguous in light of previous statements of concern about AT&T's potential for monopolization, do not mean that the Bell System would be encouraged to become the only system. For a period of three years, subject to review, AT&T would be restricted to leasing satellite capacity and only for its public message services from another carrier, in effect Comsat's domestic counterpart incorporated as Comsat General. Moreover, AT&T, the only one of the original carrier investors in Comsat still holding any such stock in 1972, would soon be required to divest itself of its 29% interest therein. With the giant thus somewhat in tow for a time, other less heavily capitalized applicants would have "a reasonable opportunity for entry." In part as a means of improving such an entrant's chances of success, consolidated arrangements would be permitted and even encouraged, but not required.

What was required were "showings of financial, technical and other qualifications" and, in addition, findings by the Commission that a grant of a particular proposal would serve the public interest, convenience and necessity and that it would not have an adverse impact on rates or services to carrier customers.

Significantly in the background throughout all these proceedings, although very alert to their every ramification, were the representatives of the broadcasting industry, different levels of which had different interests to protect. Network affiliates, in the first place, were mainly interested in having the right to own earth stations as a condition for remaining autonomous in selection of programs from the satellites, if not as an economical means of facilitating establishment of additional networks. On this point, all system applicants except Comsat were either open to or silent about other-owned earth stations. The Commission here supported and has since implemented separate earth-station ownership.

The networks themselves saw in satellites and/or microwave transmission an

opportunity for "multi-million dollar annual savings." But apart from that they seemed generally willing to await further developments before selecting a provider of such services. They did indicate their preference with regard to assignment of broadcast spectrum, made known their technical needs, and indicated an interest in a 36-month trial period during which a nationwide system would be built and test compared with landline systems. Beyond such indications of interest, the networks had neither expressed preference for any system applicant nor "even made clear any intention to convert to satellite interconnection." Nonetheless, all system applicants except Hughes/GTE and AT&T were interested in satellite program transmission arrangements with the networks and were projecting their capacity needs accordingly.

In view of their dependence on AT&T for transmission, this cautious stance on the part of the networks is readily understandable. But none of the interested parties, and least of all the networks themselves, failed to recognize the manifest advantages to be derived from a successful domsat system. In particular, satellites would significantly improve interconnection, which is important to the networks for purposes of 1. simultaneous broadcasts, 2. regional time-dealy, 3. region-specific programming, and 4. program (especially network news) assembly. In addition, it was estimated that access to satellites would cut the cost of interconnection almost in half, from \$20 million (paid to AT&T for its terrestrial services) down to an estimated \$13 million, and would make feasible a significant expansion of network interconnection, especially to more remote areas (a special concern of public broadcasting). Its costs not being distance sensitive, satellite interconnection would also facilitate economical and profitable interconnection of cable systems. This in turn could well lead to the development of a new television network. In short, the television industry seemed destined to become a big customer for satellite services.

These services commenced soon after the closing of Docket 16495 in December 1972. Five proposals were authorized during 1973, and by December of that year RCA was providing the first U.S. domsat services using transponders leased in Canada's ANIK satellite. On April 13, 1974, Western Union launched the first U.S. domestic satellite, WESTAR I, which became available for commercial service on July 26 of that year, to be joined in orbit on October 10 by a backup satellite. American Satellite Corp. (ASC), which has focused on high speed data transmission for government agencies, began services in August 1974 from three earth stations to channels in WESTAR I. In 1976, after some complicated corporate rearrangements had been worked out, Comsat General began launching satellites in its COMSTAR series intended for public message use by AT&T and GTE. Also during 1976 Comsat General's MARISAT system, for marine satellite communications, became operational, and at the end of that year the FCC approved an exotic new data transmission system proposed by Satellite Business Systems, Inc., a company owned in equal thirds by Comsat General, IBM, and Aetna Casualty.

By way of indicating that the commercial domsat business is not for corporate midgets, RCA's full system, known as SATCOM, cost \$125 million; Comsat's COMSTAR program is expected to cost AT&T and GTE a total of \$325 million;

Western Union put an estimated \$102 million into WESTAR; and ASC's system, already over \$27 million, will when completed cost \$80, million the same amount which ITT has committed to a combination microwave/data communications network. Estimated startup costs for the recently approved SBS program are \$250 million.

What sets the SBS program apart from all that have preceded it is that it will utilize new high frequency (12 and 14 GHz) bands in a manner entirely independent of terrestrial phone lines, utilizing instead a new technology based entirely on ultra-high-speed digital circuits and computer-based switching. In addition to the technological novelty, of course, is the extraordinary inroads this system is likely to make on AT&T's telephone service monopoly while at the same time giving IBM an effective monopoly over data transmission in the United States. The long-term effects of such an incursion on the telecommunications establishment are difficult to predict but easy to imagine. In the short run what is evolving in the U.S. domsat industry is a kind of crazy-quilt of theoretically private but in many ways FCC-organized firms with competing but, so far at least, apparently compatible systems. This compatibility even in the face of what some claim to be crowding has been a pleasant surprise even for the FCC, which, as a result, now seems prepared to authorize small receive-only earth stations almost routinely.

#### 4. Quis Custodiet Custodes?

As it happens, however, some careful watchers of these FCC domsat decisions have noted their strong disapproval of the way the Commission has taken to deciding such important issues without even holding hearings. The dissidents in this regard include an obscure public interest group and a well known phone company.

The public interest group in question is called the Network Project. It appeared on the scene somewhat belatedly to challenge — unsuccessfully in each instance — three different petitions for satellite authorization involving, respectively RCA, Hughes Aircraft, and American Satellite Corporation. In each case Network Project sought denial of the application on grounds that the FCC by granting it would 1. fail to enforce its own ascertainment regulations; 2. confer effective ownership of the public airways on private parties; 3. violate the public's First Amendment right to "larger and more effective use of radio"; and 4. violate antitrust prohibitions. These concerns are essentially reiterations of minority objections to the original establishment of Comsat as a private corporation, but now transferred to the domestic scene with the long history of debate over public broadcasting needs as additional background.

In the RCA case the FCC chose to deal only with anti-monopoly objections raised by competitor Western Union. In the ASC case, the FCC neatly disposed of Network Project's concerns by simply noting that ASC and RCA as well would

both operate in the common carrier mode and that public broadcasting would eventually be assured of preferential rates. Since, however, part of the ill-fated Hughes Aircraft/GTE proposal involved television program distribution by National Satellite Services (NSS), a Hughes Aircraft subsidiary formed for that purpose, the FCC was compelled to recognize that an appeal to common carrier doctrine would be inadequate in this instance. Nonetheless, the Commission proved versatile enough once again to dispose of Network Project, this time by means of a line of reasoning which, to anyone familiar with its rationale for refusing to consider broadcasters as common carriers, must at the least be characterized as ironic. The argument seems to go in both directions at once, saying on the one hand that the NSS service is that of a carrier and is available from other domsat carriers, and saying on the other hand that it is a programming service but its programs would not be the only ones available to customers. And besides (just to make sure?) the license grant would be only temporary, subject to renewal.

The Network Project group appealed the FCC decisions in these cases to the district court of the District of Columbia, which upheld the Commission unqualifiedly as to RCA and ACS and suspended judgment on NSS because of problems that had since arisen between the project proponents.

After reviewing the history of Docket 16495, the court recites Network Project's objections, then determines that they would not justify denying authorization either to a common carrier or to a CATV service such as that proposed by NSS. As to common carriers, the court recalls its decision in a case involving the Hawaiian Telephone Company where it had stated that the FCC's public interest test involves determining first whether more or better service is needed and, if so, then determining by way of "balancing equities and opportunities", which among competing applicants will best provide that service. The considerations thus triggered are those relating to market development and avoidance of "restraint upon competition." With regard to these latter kinds of considerations, the FCC has maintained a sufficient degree of surveillance, even to the point of eventually requiring special consideration for public broadcasting.

This wholehearted support for the FCC's exercise of its discretion was not repeated in a review of the FCC's imposition of broadcasting-type restrictions on cable. But in a different court, where the majority refused to review *de novo* the FCC's interpretation of a satellite service contract, a strong dissent characterized such judicial acquiescence as having given the Commission "virtually unreviewable power in matters of law." It is not irrelevant to note that AT&T was an intervenor in this latter case, the result of which was to prohibit Western Union from competing against AT&T in the areas of foreign exchange and common control switching arrangement services.

On balance, however, it does seem that the FCC is striving in the area of domsat services to clear the way for what it deems to be viable uses of a still only minimally exploited new technology. By tending to favor private firms capable of delivering such services, the Commission disappoints those who want more for public broadcasting. But inasmuch as the firms receiving FCC domsat authorization are often

non-traditional carriers who are thereby enabled to compete against AT&T, the latter has of late undertaken a frontal assault on the FCC. What it hopes to achieve is new legislation which would not only greatly hinder the Commission's discretionary ability to authorize competitive services but would also facilitate a take-over by AT&T of such services already so authorized. The cutting edge of this assault is a "reform" bill before Congress which, if enacted, would effect a surrender of virtually all electronic communications to AT&T. The emphasis throughout is on "the integrated interstate telecommunications network" which "shall be so structured as to assure widely available, high quality telecommunications services". To this end, duplication, inefficiency, and adverse economic impacts are to be avoided. How? By giving states more jurisdiction over facilities within their borders and by significantly shifting the burden onto any applicant to the FCC whose proposal would seem to deviate from the aforesaid system.

Whether this is the first call to a battle that has already been lost or the first step towards ultimate take-over, it is clear that no competing telecommunications firm need wonder for whom the Bell tolls. Corporate arrangements may, as a result, be further transformed in ways not yet foreseeable. The technology of satellite communications will undoubtedly survive them all. And once it has been as fully developed as recent breakthroughs now make appear almost inevitable, terrestrial services as we have known them in the past will become museum pieces.

Viewed from afar, at any rate, technological progress in this area is taking place by virtue of a certain inner logic that operates independently of any socio-economic obstructionism. But the closer one looks at the concrete reality of governmental decision-making with regard to domsats, the more one discerns an institutional predilection for a status quo which innovation may enhance but not supplant. Needless to say, no such incrementalist policy can withstand indefinitely the heady onslaughts of a truly revolutionary technology. And thus time is no lasting friend of obsolescence. But in the short run obsolescence tends to display all the trappings of power. In such a case, as here, technology assessment is but one aspect of a considerably more complex dialectics of change.

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**Amerykańska polityka w zakresie krajowych satelitów telekomunikacyjnych — studium ograniczeń ekonomicznych w procesie wartościowania techniki**

Analiza ograniczeń ekonomicznych w procesie wartościowania techniki przeprowadzona na konkretnym przykładzie amerykańskiego systemu krajowych satelitów telekomunikacyjnych.

Autor przedstawia proces kierowania rozpowszechnieniem nowej rewolucyjnej techniki, jaką jest telekomunikacja satelitarna oraz proces prawnego regulowania jej zastosowań. Pokazane są

elementy wartościowania nowej techniki oraz proces decyzyjno-legislacyjny w warunkach działania rynku, monopoli, prezydenta i agencji rządowych oraz społecznych grup nacisku.

Autor omówi także zjawisko konkurencji między starą (kablową) a nową (satelitarną) techniką łączności, jak również wpływ konkurencji międzynarodowej na decyzje techniczno-ekonomiczne w zakresie telekomunikacji.

**Американская политика, касающаяся отечественных спутников связи — исследование экономических ограничений в процессе оценки техники**

Анализ экономических ограничений в процессе оценки техники, произведенный на конкретном примере американской системы отечественных спутников связи.

Автор описывает процесс управления распространением новой революционной техники, какой является дистанционная связь с использованием спутников, а также процесс законного регулирования её применений. Показаны элементы оценки новой техники, а также законодательный процесс принятия решений в условиях действия рынка, монополий, президента и правительственных агентств, а также общественных „групп давления“.

Автор обсудил также явление конкуренции между старой (кабельной) и новой (спутниковой) техникой связи, а также влияние международной конкуренции на технико-экономические решения в области дистанционной связи.