THE WHITE HOUSE

WASHINGTON

October 9, 1969

MEMORANDUM FOR

Dr. Russell Drew Dr. Thomas Moore Mr. William Morrill Col. Ward Olsson Chairman Rosel Hyde Mr. Don Baker Mr. Willis Shapley Mr. Walter Hinchman Mr. Robert Scherr Mr. Richard Beam Mr. Richard Gabel

I am attaching for your personal information, copies of the replies received in response to my letter dated August 18, 1969. <u>These</u> <u>documents must be treated as privileged information</u>, for use in conjunction with the work of the task force. I have assured the respondents that these documents will not be released by the Working Group, and I expect that each of us will respect this commitment.

Clay T. Whitehead Chairman

l Atch

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X Indicates organizations to whom the 19 Sep letter frm Mr. Whitehead were forwarded for submission.

Note: Submissions were not received X from International Brotherhood of Electrical Workers or National Association of Broadcasters.

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Armonk, New York 10504

Mr. Howard W. Hughes President Hughes Aircraft Corporation Culver City, California

Dr. R. D. DeLauer President TRW Systems 1 Space Park Redondo Beach, California 90278 9/16/69 ltr responding to oursof 8/19

8/20 ltr advising they will be in Mr. George Butler 9/19 ltr from John Gayer, Chairmantouch shortly with inputs President Electronic Industries Association Satellite 9/5 ltr fm. S. G. Lutz, Chief Felecommunication Scientist, Hughes Research 2001 I Street, N. W. Laboratories, div. of Hughes Subdiv., Ind. Washington, D. C. 20006/ Aircraft Company, 3011 Malibu Electronics Div., EIA Canyon Rd., Malibu, Calif. Mr. Joseph A. Beirne President 9/17 ltr fm. Joseph A. Beirne, in reply to our letter of 8/19.

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Mr. Frederick W. Ford President National Cable Television Association, Inc. 1634 I Street, N. W. Washington, D. C. 20006 8/26 ltr advising he would subm comments before 10/1 General James McNitt President International Telephone and Telegraph World Communications 67 Broad Street New York, New York 10004

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9/19/69 ltr of reply

9/19/69 - 1tr replying to ours of 8/1

9/16/69 ltr in answer to our rqest.

Mr. Ben S. Gilmer President American Telephone and Telegraph Company 195 Broadway New York, New York 10007

Mr. Joseph Charyk President Communications Satellite Corporation 950 L'Enfant Plaza Washington, D. C. 20024

Mr. Russell W. McFall, President The Western Union Telegraph Company 60 Hudson Street New York, New York 10013

Mr. Leslie Warner President General Telephone and Electronics Corporation 730 Third Avenue New York, New York 10017

Mr. McGeorge Bundy President Ford Foundation 320 East 43rd Street New York, New York 10017

Mr. John W. Macy, Jr.
President
Corporation for Public Broadcasting
1250 Connecticut Avenue, N. W.
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Mr. Fred J. Borch 9/16 ltr fm. L. B. Davis, V. P., Chairman of the Board and Chief Executive Officer GE, 777 l4th St., Wash. D. C. General Electric Company 570 Lexington Avenue New York, New York 10022

8/22 ltr fm. Ben S. Gilmer advising Edward B. Crosland (VP - Federal Relations) to handle

9/8/69 - ltr from Joseph Chary in answer to our request.

8/28 ltr fm. Earl D. Hilburn, Exec. V. P., advising that Mr. McFall asked him to handl.

8/22 ltr fm. James J. Clerkin, J (Will have any comments by mic Sept. --Leslie Warner out of tow

9/16 ltr fm. James J. Clerkin, J replying to our letter.

9/8 Macy advising they will submit comments within the ne: several days.

THE WHITE HOUSE

WASHINGTON

August 19, 1969

The Government is considering alternative policies for the timely introduction of satellites to domestic commercial communications. Our objectives are to assure timely and full benefit to the public of satellite technology potentials and to assure maximum learning about the problems and possibilities of satellite services in domestic applications.

We are aware that your organization has had a continuing interest in this subject. While we have reviewed the public record of the last several years, your current ideas and information would be a useful addition to our review. I would, therefore, like to invite you to submit any information or comments you feel would be helpful to our working group. We expect to complete our work about October 1.

Since the Federal Communications Commission is responsible for authorizing specific operational systems, we will not be concerned with specific corporate proposals or the details of system designs. Rather, our focus will be on the economic and institutional structure of the industry, the relationships between competition and regulation, and how new uses and services can be encouraged for public benefit.

Enclosed are some of the issues we will be considering - You may wish to use these, in part, in organizing your comments. I look forward to hearing from you.

Sincerely yours,

Clay T. Whitehead Staff Assistant

Enclosure

DOMSAT

10/9/69

CHECKED FOR PERTINENT PAPERS NOTES WRITTEN COPIES XEROXED FOR CTW



10/9 Memo to the White House Grouping Work attaching replies to our 8/19/69 letter to industry requesting comments on the domestic satellite issues.

(Originals in this folder)

Copies were sent to the Central Files of the White House 5/22/70

5/22/70

To: Central Files

From: Eva Daughtrey

We are now retaining the originals. Attached are zerox copies for your files. Please charge them to Mr. Whitehead's Office instead of Mr. Kriegsman's.

EDaughtrey: jm

American Broadcasting Companies, Inc.

1330 AVENUE OF THE AMERICAS · NEW YORK, N. Y. 10019 · LT 1-7777

LEONARD H. GOLDENSON PRESIDENT September 16, 1969

Clay T. Whitehead, Esq. The White House Washington, D. C.

Dear Mr. Whitehead:

In your letter to me of August 19, 1969, you stated that the Government is considering alternative policies for the timely introduction of satellites to domestic commercial communications, and requested ABC's current ideas and comments on a number of matters grouped by you under four main headings.

I appreciate this opportunity to submit ABC's views on the benefits of satellite technology, particularly in the field of network broadcasting.

Ι

Benefit to the Public from the Economic and Service Potential of Satellite Technology

In its initial filing with the Federal Communications Commission in September of 1965, and in each of its six subsequent submissions in FCC Docket 16495, ABC has urged the Commission to approve the positioning in equatorial orbit of a synchronous satellite (including a spare), in the vicinity of 100° west longitude, to be used exclusively by the commercial and educational networks for distributing radio and television programs to individual broadcast stations throughout the United States (including Alaska, Hawaii, Puerto Rico, and the Virgin Islands).

As there pointed out, a specialized system tailored to the needs of the broadcasting industry will maximize the inherent advantages possessed by synchronous satellites for program distribution purposes, advantages not presently procurable for video distribution purposes by any other method.

Currently the programs of the commercial and educational TV networks are made available to their owned, affiliated, and associated stations in four different ways: (a) by AT&T coaxial and microwave lines; (b) by picking up off the air and rebroadcasting signals of other nearby stations affiliated with the same network; (c) by station controlled or privately owned microwave relay systems; and (d) by film, tape, or kinescope "bicycled" from station to station. For example, 10 of ABC's TV affiliates in Alaska, Hawaii, Puerto Rico, and the Virgin Islands are wholly dependent on "bicycled" recordings for the programs of the ABC network. In addition, 50 of ABC's affiliates depend on off-the-air pickups from a given station, meaning that they lack access to particular network feeds not carried by the stations on which they rely. Another 47 are dependent on private microwave. In short, of 252 primary and secondary stations associated with the ABC television network, more than 100 (primarily because of cost considerations) are not serviced at present by AT&T regular coaxial and microwave lines and are thus not fully interconnected with the ABC network. A not dissimilar situation exists with respect to the other commercial networks. And since the TV networks, because of cost factors, normally lease AT&T's land microwave system for only 16 hours per day, the networks are operational on a live interconnected basis only two thirds of the time.

If the networks were collectively permitted to establish a synchronous satellite system for distributing their network programs to their local affiliates, the public interest advantages which would result are significant. By such a distribution system, the networks would be functional and interconnected with their affiliates around the clock; they would provide a first direct service at all times to Hawaii, Alaska, Puerto Rico and the Virgin Islands; they would provide facilities by which to transmit educational TV programming to all noncommercial educational stations throughout the United States and its insular possessions, with the transmitting costs borne by the commercial networks. What is more, instead of feeding their affiliates in the Eastern and Central time zones at the same time, and those on the West Coast three hours later (with stations in the Mountain time zone picking up network entertainment programs "as best they can"), it would become economical for the first time, under the video satellite distribution system here contemplated, for local stations to receive by satellite and to retransmit all network entertainment programs, in each of four time zones, on local time.

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With the satellite functional 24 hours a day, the networks would be potentially operational on a live and interconnected basis at all times, thus greatly enlarging their capacity to service their local affiliates, particularly with sudden news developments, and special events, and thereby substantially augmenting their usefulness in national emergencies and for civil defense purposes. Emergency situations can be readily envisaged where the national interest and national defense require that persons residing in outlying States and possessions, no less than those in the continental United States, be reached by live interconnected television facilities. Unlike at present, every affiliate with its own receiving dish would be able to pick up any given network program, whether that program is carried by another affiliate or not.

Such live interconnections 24 hours a day, for outlying affiliates as well as those in congested areas, would be economically feasible only through satellite technology. Inasmuch as only a single repeater is needed, a satellite distribution system has a significant advantage over a conventional ground microwave distribution system -- resulting in a signal as good as or better than the signal presently provided by leased land microwave facilities.

At the present time, even with AT&T's facilities leased only two-thirds of the day, with the entire United States limited to two time zone feeds, and with more than a third of their affiliates serviced in other ways, the three commercial TV networks spend approximately \$45 million annually on inter-connections (exclusive of local loops). Although this figure is less than 1/2 of 1% of AT&T's gross, it is a substantial item in the program and operating budgets of the three networks. Under new AT&T rates filed August 29, 1969, those charges will exceed \$65 million annually. Although the networks, the Ford Foundation, Comsat and AT&T are not in complete agreement on the matter of capital and operating cost requirements, there is reason to believe that an interconnected network satellite system operational 24 hours a day, supplying separate program feeds to each of four time zones, could be launched, operated and amortized at roughly half that amount. And whether a program is picked up by 100 stations, or ten times that number, the transmitting and distributing costs (other than individual receiving dishes) would remain constant. The savings in distribution costs thus accruing to the networks, and their affiliates, if commercial and educational programs are distributed

- 3 -

by satellite rather than by terrestrial microwave and coaxial facilities, would become available for program development, for assisting the educational networks by providing transmitting facilities without charge, and for additional news and public service programming for the American public.

ABC, CBS, NBC, Ford and others are espousing a singlepurpose (dedicated) satellite to be used exclusively for network program distribution purposes. One satellite (and a positioned spare) would take care of the needs of at least four commercial networks and an educational network to be programmed on a "local time" basis and around the clock. By confining the satellite to a single purpose (i.e. network video distribution) the satellites thus contemplated would each have 24 channels, twice the number initially proposed by Comsat and by AT&T. The limited 500 MHz bandwidth would be used twice by the ABC and Ford systems, a feature which could be incorporated into multipurpose satellites only at the expense of other needed features. A most notable penalty of a multipurpose system would be the increase in spacecraft needed to serve the double number of channels, and the larger receiving dishes required by local stations for pickup purposes. The single-purpose system avoids these consequences by using narrow antenna beams, thus achieving higher effective radiated power.

The contention that a dedicated television distribution system would result in needless duplication of hardware and a wasteful usurpation of valuable spectrum space is not well taken. Both Comsat and AT&T seemingly recognize that television networks (educational and commercial) will need at least 24 channels for program distribution purposes, i.e. an entire satellite with no unused space there available for other purposes. Thus, spectrum shortage is not an argument for multipurpose over a dedicated satellite for network program distribution purposes. Moreover, there is no foreseeable dearth of equatorial space for synchronous satellites near 100° west longitude. For its global satellite operations Comsat is stationing its synchronous satellites off the West coast of Africa (near the 20th meridian), in the Pacific West of the Gilbert Islands (near the 180th meridian), and in the Indian Ocean. In contrast, the optimum equatorial location for synchronous satellite systems designed to serve the domestic needs of the 48 contiguous states, Alaska, Hawaii, and the Caribbean would be in the vicinity of the 100th meridian. The domestic needs of Mexico and Central America could be served by satellites stationed to the East of

the 100th meridian (80°-100° west longitude). With all of South America lying East of the 80th meridian, the domestic needs of the two Americas will not conflict.

As repeatedly asserted by Hughes (Space Systems Division), domestic satellites may be positioned within 1.5° of each other at the equator, with even closer spacings possible. Thus, there are approximately 20 satellite station locations available between the 100th and 130th meridian, with no foreseeable demand for these positions for global purposes, nor for domestic operations in any countries other than the United States and Canada. Thus, the two single-purpose satellites which the networks are espousing, whether launched and operated by the networks as a joint venture, or by a non-profit organization, or by a common carrier would take up only 10% of the equatorial locations for positioning satellites in the region between the 100th and 130th meridians, with 90% of such locations still available for common carrier and/or other specialized uses. Certainly in the years immediately ahead, a video distribution system, such as the networks are proposing, offers the most immediate economic potential, and for one of the most obvious uses to which a domestic satellite can be put.

In short, a dedicated system, with an entire satellite and spare needed for video distribution purposes alone, is fully warranted. A dedicated system will do a better job for the broadcasting industry, particularly one operated by them, than a system having diversified and possibly conflicting responsibilities to several industries. What is more, a multipurpose approach is certain to delay the inauguration of a television satellite system urgently needed for distributing network programs -- while more complex, heavier, and costlier satellites are being fashioned to accommodate wholly unrelated services. The more complex the equipment and the more switching involved the greater is the danger of the satellite ceasing to function, necessitating new launchings which would not be required for a single-purpose dedicated operation devoted solely to the needs of the television networks (educational and commercial). With experience gained from Early Bird and Intelsat, such a single-purpose "bird" can be placed in operation almost immediately and its usefulness not delayed by the time necessary to adapt the satellite to unrelated and less well developed purposes. And what is especially important, in the event the satellite (contrary to ABC's recommendations) is operated by a common carrier, the costs of a dedicated system unlike that

of a multipurpose system will remain identifiable and not be buried in a rate base -- with the broadcasting industry required to carry the load for other industries.

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Thus, ABC believes that the public interest would be served by allowing nongovernmental entities (the private sector), and particularly the television networks which need for themselves the contemplated capacity of an entire "bird", to construct and operate a synchronous satellite for network program distribution purposes within the United States and its territorial possessions, without the intermediary of Comsat, of Intelsat, or of a domestic or international carrier. The Commission has frequently found, and rightly so, that "public interest" considerations warrant grants of radio frequencies for private business uses, thus bypassing the "common carriers". Taxicabs, airlines, railroads, pipelines, CATV systems, and numerous other private enterprises, singly and jointly, have been repeatedly granted their own radio frequencies, for their business needs, without the intermediary of a common carrier. And in 1958, over AT&T's objections in the case of Television Intercity Relay Stations, the Commission (in the interest of "aiding the fullest possible development of television service in the United States") granted radio frequencies to broadcasters with which to pickup and transmit programs from mountain peak to mountain peak, and tall tower to tall tower.

With Early Bird and Intelsat demonstrating the greater practicability and economic feasibility of satellites over circling B-29's, tall towers, and mountain peaks, there are no discernible reasons why networks and their affiliates should not be permitted to take advantage of space-age developments -so long as such uses do not (and they would not here) interfere with the global system and the viability of various common carrier services. In adopting the Satellite Act of 1962, Congress did not redistribute domestic traffic, nor did it conclude that radio frequencies then used for specialized and private business purposes, without the intermediary of a common carrier, should hereafter be shunted to Comsat, to AT&T, or to other domestic or international carriers.

Learning About the Problems and Possibilities of Satellite Services

The economic and technical capabilities of the satellite system can best be understood by comparing them with the economic and technical capabilities of competing technology for providing similar services. Questions with respect to the alternatives must be considered before a reasonable judgment can be developed as to the appropriate application of satellite technology in some of its ramifications. Both the satellite and non-satellite technologies are evolving rapidly with many new developments in each. With respect to the satellite systems, the major economic impact results from uncertainty about the potential lifetime of the satellite. The second major impact results from the reasonableness of projected earth station capital and operating costs. Both of these questions can only be answered from continued operated experience. Satellite life history on current DOD and NASA and commercial programs are being developed. The cost of constructing appropriately sized earth stations can be ascertained after a few are installed.

There are a series of second order effects upon the system capability and economics which result from various technical uncertainties relating to frequency sharing, polarization, isolation, etc. These uncertainties, however, are small in contrast to the first order effects described above. Certainly the initial systems should operate in the under 12 GHz bands.

The operational uncertainties are in some degree dependent on organizational structuring of the particular domestic satellite system contemplated. There would appear to be several potential classes of user communities which might be served by special systems. They could include broadcast TV distribution, educational TV distribution, mobile services and the more conventional common carrier augmentation to the existing system.

Each of the potential satellite service groupings here mentioned have different combinations of economic and market motives. In some cases the satellite system is in direct competition with existing systems and in other cases the satellite system would provide services which are not presently provided, particularly in the broadcast area because of cost considerations.

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It is unreasonable to envision that the broadcast community will use a significantly larger amount of satellite service if they are the owners of the system. It is interesting to note in this instance the similarity between communication system and transportation system, wherein -- as the country has evolved -- the transportation system has developed from a few major common carriers having common uniform equipment, i.e. railroad cars and barges to a highly specialized combination of economically designed units, petroleum cars and tankers, grain and ore boats, cargo and passenger airplanes where in each of the market requirements have been satisfied by a separate technology and very often by separate organizations designed to utilize that technology.

The maximum utilization of satellite technology will be a constantly evolving condition as the technology itself evolves. It is predictable that in the future classes of service which are now served by other than satellites will be served by satellite and vice versa. The general "market place" should be the test of which technology best suits the needs and these needs and technology will change.

There is certainly enough present knowledge to proceed on various attractive system configurations. There certainly is enough "orbit space" and frequency to permit a very significant contribution by satellites to the communication needs of the country.

It would appear that much of the information required to answer the questions you pose can best be obtained by the initiation of one or more operational systems, including one for video distribution purposes. Certainly most of the questions relating to cost, technical performance, and operational problems can only be resolved by launching one or more operational systems. If the telephone common carrier community desired such a pilot system, then many of the operational and economic questions connected with such a service could be resolved. If the broadcast community desires to experiment with such a system, as they most definitely do, they should also be permitted the same opportunity. Only by such testing and experimentation can we develop the knowledge to provide the basis for more ultimate decisions.

Incentives for Innovation by Communications Firms to Develop New Telecommunications Services and Markets

III

In the Radio Act of 1927, carried over into the Communications Act of 1934, Congress provided for a privately owned and operated broadcast system rather than one owned and managed by the Government. In the years which have followed, private industry has developed nationwide AM, FM, and TV broadcast services which virtually blanket the entire United States, a system which is now being copied in several other countries. Just as private companies linked the entire country together by rail, so private industry is prepared, if not precluded by statute or administrative fiat, to interconnect by satellite some 860 existing TV stations, with more local stations yet to come.

While there may be valid reasons for creating a special entity to speak for the United States in the <u>global</u> field, an approach initiated by Congress in 1962 and since endorsed by two special committees (with antitrust laws to be waived accordingly), ABC strongly urges that no monopoly be granted a single company in the domestic field.

Just as taxicab, pipeline, railroad, CATV and other companies can utilize radio frequencies to serve their own special business needs, side-by-side with domestic carriers providing similar competing services, so there is room in our economy for the establishment of domestic non-common carrier communication satellite by nongovernmental entities in the domestic satellite field. Such facilities developed by private business would provide an alternative to what would otherwise be a common carrier monopoly. Healthy competition between the private sector and the carriers, in the domestic area, should be encouraged.

Since the broadcasting industry is already closely regulated by the Government, a policy allowing the networks to launch and operate satellites by which to distribute their programs to local stations throughout the United States and its insular possessions would not have untoward consequences. The revenues thus lost to AT&T, currently constituting an infinitesimal portion of its net, would have no adverse impact on AT&T's gargantuan operations.

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The technical and economic feasibility of synchronous satellites for video distribution purposes has already been demonstrated by AT&T's Telstar, by NASA's ATS 1 and 3 series, by Comsat's Early Bird and Intelsat series, and by Molniya satellites already in operation in Soviet Russia. No additional research or development is needed to speed the establishment of an economically viable video distribution system by satellite. ABC is unaware of any uncertainties or impediments to technological or market innovation -- insofar as broadcasting is involved -- which could not be carried out by the private sector of our economy.

If given a green light, and permitted to retain the economies which would result from a satellite distribution system over current terrestrial carrier operations, ABC is confident that the networks, by a joint venture or other like arrangement, would be prepared to proceed immediately with the launching of a satellite (and a needed spare) by which to transmit their programs (both commercial and educational) to their respective affiliates. Barring any economic recession, we believe that needed capital would be procurable from the private sector.

Certainly in the broadcast networking field, where an entire satellite and positioned spare are needed for program distribution purposes, we recommend a dedicated (single-purpose) system owned and operated by the networks themselves. Scores of other businesses, with more limited specialized demands, will have no need around the clock for an entire satellite for their particular operations. And to them the required capital investment for an individual satellite would not make sense. Their varied and less regular needs could no doubt be best handled by a multipurpose satellite operated by a domestic carrier.

Such a bifurcated setup, with a few dedicated satellites operated by one or two industries (e.g. broadcasting and perhaps AIRINC) and with several multipurpose satellites operated by various domestic carriers, would provide healthy competition. And such competition would no doubt continue unless and until the carriers demonstrated that they were able to do a less costly and better job for the broadcasting industry and the viewing public.

Since a domestic satellite system (as distinguished from a global one) can be capably operated and adequately financed by private industry, subject to the existing licensing and regulatory functions and powers of the Federal Communications - 11 -

Commission, ABC sees no need for the establishment at this time of a public or governmental corporation for such a purpose. With a video distribution system by satellite urgently needed, delays attendant upon special legislation where not needed should be avoided.

IV

Degree of Regulatory Control and Impediments to Technical and Market Innovation

Under the Communications Act, "a person engaged in radio broadcasting shall not, insofar as such person is so engaged, be deemed a common carrier" (47 U.S.C. Sec. 153(h)). ABC is not an "existing carrier" nor does it contemplate becoming an entity intending to seek authority to provide via satellite "common carrier services, general or specialized." ABC is a non-governmental entity, which, individually or in conjunction with other commercial and/or educational network organizations desires to construct and operate (by joint venture or other similar contractual setup) communications satellite facilities for the purpose of transmitting network programs (commercial and educational) to affiliated and associated stations within the United States and its insular possessions. To that end ABC is prepared to join with other network organizations (commercial and educational) in establishing a separate legal entity to construct and operate such facilities. Under such an arrangement, it would be ABC's view that satellite transmission services would be made available to the noncommercial educational networks without cost to them. This would greatly enhance the establishment of a truly national educational television system.

Under such a setup, there would be no occasion to establish a rate-base or for the Government to prescribe rates. Provision would need to be made to include new nationwide networks which become operational at some later date, bearing in mind that the common carriers in due course will no doubt provide video distribution services by satellite to limited, specialized, or regional networks.

Once again ABC deems the point worth stressing, that the broadcasting industry is a highly regulated industry. As a consequence, particularly during the "initial phases of domestic commercial satellite communications", ABC sees no need for highly specialized additional regulations. Any unfair practices, and any conduct inimical to the public interest, are matters over which the Commission has ample authority and can take any needed action in the event they occur. Just as the Commission prescribes a minimum of regulations governing the use of radio frequencies granted taxicabs, pipelines, railroads, CATV, etc. for their business needs, so a minimum should suffice if the networks are granted a set of frequencies (capable of duplication by another satellite 1.5° removed) for more efficient network program distribution purposes.

Conversely, common carriers providing in due course multipurpose satellite services for facsimile, data processing, maritime, etc. would be subject to the usual common carrier regulations as they are at present (rates, rate base, nondiscrimination, etc.).

In short, the long range regulatory policies which are most desirable are those which will encourage private development and innovation side-by-side with common carrier growth -- thus providing a degree of competition, obviating a complete monopoly, and affording the user an alternative, with the public in turn thereby furnished with the best and cheapest service possible.

The ultimate regulatory policies and goals with respect to satellite and terrestrial communications should be much the same. While the implementation of these policies with respect to telecommunications via satellite may differ in some details from regulations applicable to terrestrial systems, the ultimate goal should be the same -- to encourage private industry, to lower costs, and to benefit the public.

Competition, with general regulatory guidelines, leaves room for innovation, experimentation, growth, and development, all of which can be unintentionally curbed by too detailed regulation. In new and rapidly changing fields, broad guidelines rather than detailed requirements, both in statutes enacted by Congress and in rules promulgated by an administrative agency, are much to be preferred. So that American ingenuity and the private sector or our economy may flourish, freedom to compete without needless redtape is essential.

We trust that you will find this information helpful.

Very truly yours,

Leonard H. Soldenson

Leonard H. Goldenson

NATIONAL BROADCASTING COMPANY, INC.

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September 19, 1969

Mr. Clay T. Whitehead Presidential Staff Assistant The White House Washington, D. C.

Dear Mr. Whitehead:

I welcome the opportunity offered by your letter of August 19 to outline NBC's suggestions on the structure for domestic satellite communications development. The government's interest in stimulating progress in this promising field is most gratifying.

During the four years in which the subject of domestic satellite communications has been under governmental scrutiny -- by the FCC in its Docket No. 16495, by Congressional exploration of non-commercial "public" television, and by the Task Force study of the entire communications field -- communications satellites have proven themselves in international communications and have established their special advantages of economy, flexibility and reliability. During this same period, the Soviet Union has developed and put to extensive use an elaborate domestic satellite system.

It is high time for this technical advance to be put to work in the United States for the functions it can perform reliably and economically. It should not be delayed by theoretical considerations of protection for regulated public utilities or of unity of domestic satellite communications service where as here the public interest does not warrant such protection or unity. Mr. Clay T. Whitehead September 19, 1969 Page Two

Admittedly, solutions to issues with respect to ownership, regulation, and control of a domestic satellite system will have to be evolved through further experience with an operating system. In our opinion, the resolution of these problems can be deferred without prejudice while practical, positive action is taken to resolve remaining technical problems and to make a start on bringing to realization the great potential of this new technology.

It is neither necessary nor advisable, in NBC's view, to cast the structure of a domestic satellite system into a rigid mold that cannot adapt to rapidly changing circumstances in a novel field. Nor is it necessary to pattern this structure on the basis of conventional common-carrier or specializedservice concepts that have developed in other fields and for different needs and purposes. Rather, we believe, it is important to

- move forward aggressively so that an operating domestic system can be brought into being as quickly as is practicable;
- 2) do so on a pragmatic basis designed to make the most of the special advantages of satellite technology in meeting the domestic communication needs it can now best serve; and
- preserve flexibility to meet future needs of new classes of possible users.

One of the ideal applications of a satellite system in meeting existing needs is radio and television program distribution. The very nature of networking (i.e., large volume, continuing distribution from one point to many points) is especially well suited for state-of-the-art satellite distribution. NBC believes that no other application of satellite communications technology can offer such significant, immediate and highly visible benefits to as many people as its use for commercial, non-commercial and instructional television and radio program distribution. Mr. Clay T. Whitehead September 19, 1969 Page Three

The recently released report of the National Academy of Sciences Central Review Committee states that the use of satellites for network television transmission for both private and public sectors of the industry seems "so easy technically, so reasonable economically and so potentially desirable that we recommend consideration of their implementation by the proper authorities as a matter of high priority."

Other fields of endeavor interested in such activities as gathering and transmission of computer data, air and ground transportation control and environmental research, will be telling you their own stories. Experience gained from the use of satellites for network broadcasting and for other ready services will surely expedite the future use of satellites for many other worthwhile purposes.

To provide the working group with more specific and detailed responses to the issues as you have outlined them, I enclose a statement entitled "The Economic and Institutional Structure for Domestic Satellite Communications" which I have had prepared by the appropriate NBC personnel. Part I of the enclosure addresses itself to your stated particular interest in "the economic and institutional structure of the industry, the relationships between competition and regulation, and how new uses and services can be encouraged for public benefit." It comments on the third and fourth issues in your questionnaire: "Incentives for innovation ... " and "Degree of regulatory control..." along with the third and fourth questions of the first issue: "Benefit to the public ... " Part II deals with remaining items in the questionnaire.

In conclusion, to achieve the national goals with respect to leadership in the peaceful uses of space, and to obtain practical public benefits from the space program, we urge a timely decision from the White House and from the Federal Communications Commission with respect to the subject matter of FCC Docket No. 16495, authorizing an initial program along the lines described in our response, with appropriate safeguards to maintain complete flexibility with respect to the ultimate pattern of ownership, operation, and regulation. We also suggest that following this Mr. Clay T. Whitehead September 19, 1969 Page Four

decision a conference of "interested users" including broadcasters, carriers, government agencies and others who have expressed interest in utilizing satellite communications technology for domestic purposes, be convened by the newly appointed Chief of the Domestic Satellite Task Force.

The technology is ready, the public benefits are obvious, and the willingness of the private sector to provide the resources required to implement a domestic system has been affirmed. What is needed now is the timely Executive action to make a domestic satellite communications system for the United States a reality.

We at NBC will be delighted to see progress made on the domestic satellite issue, and are most hopeful that a viable beginning will emerge from the efforts of the White House working group.

Sincerely,

ulian Hoolman Julian Goodman

NATIONAL BROADCASTING COMPANY, INC.

THE ECONOMIC AND INSTITUTIONAL STRUCTURE

FOR

DOMESTIC SATELLITE COMMUNICATIONS

September 19, 1969

Addressed to the issues set forth in the enclosure to the letter of August 19, 1969 from Mr. Clay T. Whitehead to Mr. Julian Goodman

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PART I

A. FCC Domestic Satellite Task Force

Initially, because domestic satellite potential is such a new and major development, the FCC may wish to consider forming a new specialized staff unit to coordinate and encourage experimentation with a wide range of satellite uses. A pattern already exists for such a Domestic Satellite Task Force with its own "Chief", a unit, separate and distinct from the other FCC bureaus and perhaps eventually evolving into a bureau itself, responsible for development and regulation in its special field.

This would insure that the strictly common carrier orientation of the present highly developed international communications regulation, satellite and otherwise, does not limit or distort the potentials of a domestic system operating in a substantially different environment and capable of accommodating many users simultaneously. It would foster consideration of regulatory policies that might be distinct and different from policies for terrestrial systems. This is desirable because of the differences in domestic satellite functions from those of either the international satellite system or the domestic terrestrial system. The Domestic Satellite Task Force would oversee spectrum utilization, set interference standards and service standards, process applications, assume responsibility for the administration and implementation of any relevant aspects of the Communications Satellite Act of 1962, and coordinate with the International & Satellite Communications Division of the Common Carrier Bureau any interrelations problems with

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the global systems and with its other divisions the interface of the satellite system with the terrestrial system.



EXISTING INTERNATIONAL SATELLITE RESPONSIBILITY

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B. A Semi-dedicated System

Considering the technical advances that have occurred while a domestic satellite development has been under study, it appears that a sharp dichotomy between "dedicated" vs. "multi-purpose" does not relate so much to <u>system design</u>, as it does to economic, political and regulatory differences. It is with the hope of resolving the latter on a positive basis that will foster progress with flexibility, that we suggest a "semi-dedicated" system.

1. Sharing of Satellite Capacity

Our proposal would essentially divide up the available satellite capacity initially into three separate parts or groups of channels (transponders), each group dedicated full time to a separate community of users:

- (1) One-way television and radio network and similar distribution.
- (2) Two-way data, record and facsimile.
- (3) Two-way telephone message traffic.

Viewed in this way, the overall satellite system is "multi-purpose", but the separate user groups, isolated from each other within the three separate sections of the satellite, can be free to develop and experiment with their own initial system plans on an individual basis. Nor would this preclude other future uses, after a system was in operation. Indeed, we are here referring to an initial operating phase, to move the project on a sensible basis from discussion to reality. When we speak of the satellite, it could be several satellites, depending on

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the technology, reliability requirements and demand for channels.

2. User Groups

As to the industry's approach to domestic satellite development, NBC suggests that three distinct "user groups" be organized at the start on an ad hoc basis to develop the immediately prospective uses of the technology. These groups would parallel the initial separate and main functions of the domestic satellite segment: (1) Television and radio network distribution entities whether for commercial or public television or instructional programs, complete with all attendant services, together eventually with broadcast facsimile and any other entities turning up with information distribution needs serviceable within the same art; (2) Computer data, record and facsimile organizations (including the special service microwave carriers) other than as stated below and developers of such prospective services as "tele-mail"; and (3) Proprietors of telephone message traffic, with regard to extensions to the nationwide terrestrial dial switched network including the present data and future picture-phone uses of this network and related services.

The "user groups" would be comprised of the interested parties in the three fields identified above, each group free to organize itself, raise money, analyze the interests of its members, define their requirements, conduct experiments and agree upon an initial system. The group could expand or contract as potential users in the same general category either become interested or lose interest. A new group could be formed if a new category of prospective users should develop.

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The user groups would have minimal restrictions. Since they would be specifying their own system components to meet their specialized needs, the overall system design would probably result in minimum costs and maximum innovation. In attempting to optimize their systems, they would tend to stimulate the growth of a widespread and responsive industry building itself to service the countless potential aspects of satellites.

Each user group would be an essentially nonprofit organization, staffed by experts contributed to it by member organizations in much the same way broadcasting companies organize their news pool operations on Presidential and other limited access pickups, dedicating certain personnel to work exclusively for the group. NBC, for example, being a member of the television-radio user group, would assign one or two people to function totally within that group to determine or help determine the distribution methods, channels, specifications, economics, and recommend money commitments and initial system design to the broadcast users for their approval.

Each user group would be free to decide, for example, what ground stations would best suit its interests. Since the satellite is a multiple access instrument, there would be no need for all users to funnel their traffic through one ground station or a particular entity in order to transmit to the satellite. The telephone message group might decide to operate out of Andover. The data and record group might decide to utilize Etam, West Virginia, while the television-radio group might decide to have a ground station built at a new site in

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New Jersey. The individual ground stations, therefore, could be tailor-made to suit the exact requirements and flexibility of each user group, and thus maximize the satellite's advantage to each separate group.

The FCC's Domestic Satellite Task Force would function on the applications for the construction and operation of the various transmitting components submitted by the groups and for the satellite aspects submitted by Comsat in the light of the requirements and specifications developed by the respective groups, and would supervise Comsat in the correlation and interrelation of the domestic and international frequencies and locations.

The user groups should also be free, under the Domestic Satellite Task Force, to develop experimental rates based on real expenditures of money related to specific methods of transmission. Experimental rates, based on costs, could be continually reviewed before any permanent ones were formulated. This would encourage experimentation within the actual costs of the particular system being used, divided among users participating pro rata or on the basis of the traffic involved.

It would be one of the mandates of the television-radio group to explore the avenues of maximum service for its public broadcasting and the other non-commercial broadcaster members on as economical a basis as possible consistent with applicable governmental policies.

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C. Comsat

During the initial operating phase at least, Comsat would act as a technical liaison for the three user groups, and as an overall manager of the system under the direction of the user groups.

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Comsat could provide the technical interface of each group, to the extent the group wished to have Comsat do so, with anyone having satellite system expertise. Obviously, the three groups would provide a stimulus and requirement for Comsat to develop suppliers and manufacturers of all types of satellite hardware, thus fostering competition and a responsive electronics industry to serve the wide potential of satellites.

The user groups would also require the advice of Comsat and their Research Labs to define the parameters of the system, coordinate the peak demands among the three user groups, and conduct experiments utilizing the hardware and experience from NASA, the Environmental Science Services Administration (ESSA), carriers, foreign entities (including Canada) and domestic specialists in this field.

Comsat's function would not involve its fashioning and promoting of a preconceived pilot program to the user groups nor establishment of policy. Rather, it would be there to render service, give advice, provide and arrange for launching of and own (if the user groups so desire) and operate whatever satellite elements are decided upon and furnish on a regulated lease or shared cost basis to each user group its share of satellite transponders, provide whatever other elements the groups might seek its help on, and furnish such interim and long-range financing as might be required.

Much as it does now internationally, Comsat would test available

hardware, seek suppliers of new hardware, and provide custom-designed satellites, adequate emergency satellites (already in position) and enough spare transponder capacity, in orbit or launch-ready, to take care of expansion and contingency needs. It would also be in a position to assure the coordination of the domestic and the international space requirements on such matters as frequency allocations and parking spaces and Major upleg transmitter locations.

D. Television-Radio System

The foregoing has outlined our suggestions for structure of an initial operating phase of a domestic satellite system, in terms of:

- A. The FCC Domestic Satellite Task Force
- B. The shared satellite capacity and the independent but coordinated user groups
- C. Comsat

Our suggestions for the structure of the system aspect of particular interest to NBC -- the radio-television distribution operation -- follows:

1. Organization



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2. Function

Consider a typical television broadcast from New York to a network of affiliated stations: the signal might leave New York via private microwave feeding the television-radio ground station in New Jersey, mentioned earlier. This ground station would have been conceived by the television-radio user group, designed in conjunction with Comsat and its numerous suppliers to user specifications coordinated by Comsat, managed and operated by Comsat under user direction, and owned under one of a number of user/industry options, but not necessarily by Comsat and not by another carrier.

The signal would be transmitted to the particular transponders in the satellite that have been dedicated to television-radio network distribution. The satellite would have been built under Comsat's direction to the <u>combined</u> specifications of the three user groups. Comsat would operate the satellite and give access to the applicable sections of it to the user groups.

The signal would then beam down to a specific broadcast time zone or zones. Once the signal has left the satellite, Comsat's direct responsibility would end.

The signal is then received by the small 15-foot diameter dishes at station locations in the time zone and fed directly to the local transmitters. Depending on circumstances to be assessed by the broadcasters, these small ground stations, conceived by the user group with design and mass construction interfaced through Comsat, could serve individual broadcasting stations of all the

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stations in a given community. They would be operated and maintained by the broadcasting stations and owned by them or other entities under one or a number of user/industry options but not by Comsat or a carrier.

A certain amount of liaison would be required between these ground stations and Comsat for initial and revised pointing instructions and guidance in emergencies. Basically, however, they would be unattended most of the time.

It must be noted here that during the initial development of the system, existing AT&T terrestrial facilities would have to continue to be utilized in some areas on a regular basis interconnected with the satellite system until ground stations have been installed and for a time also as backup and on an occasional basis to originate television-radio signals from a station or from a remote pickup to feed New York or other input location for distribution to the stations.

In time, however, broadcasters might want to originate signals to the satellite, in which case plug-in modules could be designed to equip some of these stations with transmit capability utilizing the same dish.

One advantage of the small receive-only ground station concept is that it can alter the traditional approach to satellite tariffs wherein each earth space segment is now a chargeable item (current example: one uplink and three simultaneous downlinks means four separate charges). The television-radio distribution system

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would have only one real-time cost, the satellite transponder rental or cost share or at most two if the user group were to use an existing Comsat earth station or to have Comsat undertake one for them. The concept of charging for each down-leg in a domestic system or tariffs based on the mileage formula would not be applicable.

A second advantage of a semi-dedicated distribution system is the ability to identify and isolate television and radio costs from those incurred by the message or data users.

A third and important advantage is the ability of the satellite distribution system to free up existing AT&T terrestrial broadband channels for increased message traffic. This might mean lower rates for long distance telephone users in general.

So much for a broad-stroke outline of NBC's proposal for domestic satellite system structure. The balance of this reply identifies and deals with other items in your questionnaire.

PART II

A. Benefit to the public from the economic and service potential of satellite technology

1. What specific services that are not now available would be made possible and economically feasible through satellite technology?

- a. Time zone re-broadcasts to the Central and Mountain stations could be added so that these audiences may see the program schedule broadcast in its optimum time periods. This is particularly important where children's programs, public affairs, and particularly adult entertainment are involved.
- b. Real time service to Hawaii, Puerto Rico, the Virgin Islands and Alaska could be initiated.
- c. There could be direct interconnection of stations now not interconnected and of those dependent on other network stations for their feed.
- d. The hours of service could be extended through the availability 24 hours a day of a semi-dedicated system.
- e. The economies and efficiencies that satellite systems promise could lead to the activation and affiliation of additional stations and provision of additional program choices, thus adding to the diversification of communications media.
- f. Several parallel simultaneous feeds could become a possibility should market potential warrant, i.e., repeating programs at more convenient time periods, or providing an all-news channel.

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- g. Since the satellite channels could be designed to user specifications, additional services might be incorporated,
 i.e., stereo sound, cue information, control information,
 program information, and possibly broadcast facsimile.
- h. Public television and radio and other non-commercial broadcasting and their cultural, educational and instructional programming services could be brought to the public in all parts of the country with the benefit of all the foregoing advantages.

2. What specific services now being offered could be provided more effectively or more efficiently through satellite technology, and what economic savings would accrue?

- a. With respect to commercial television networking, the utilization of satellites could lead to improved signal quality, particularly important to households receiving service from stations interconnected by means of off-the-air signals and to those on the far end of any microwave relay complex.
- b. As has been sought in the intercontinental sphere, costs of transmission of a wider range of news pickups would be brought within the range of the news program budgets.
- c. We believe that the authorization of network program distribution via satellites will free thousands of miles of voice-grade telephone circuits already constructed, to help fill the nation's current needs and part of its future needs

without requiring the construction of new facilities at inflated (and inflation-stimulating) prices.^{*} AT&T long-line plans include the upgrading of its microwave TD 2 channel units currently handling single video channels (equivalent to 600 two-way telephone circuits) from a capacity of 900 to a capacity of 1200 two-way telephone circuits. The next generation of microwave, TH 1, doubles that, and the next two generations of coaxial cable go to 3600 and 9000, but none of these, according to AT&T, can handle more than a single video channel or intermixed video and telephone. The conversion of many miles of underutilized "television" facilities to other services could reduce the need for major capital expenditures on the part of the telephone companies and reduce the rates for users of interstate telephone communications facilities and further postpone the need for satellite message channels for that service.

B. Learning about the problems and possibilities of satellite services

1. What information about technological capabilities and performance of satellite systems is needed to resolve uncertainties about the technical and economic feasibility of potential systems?

a. Can a single one way satellite channel be designed to incorporate

(1) a standard color television signal with a hidden color bar reference and digital display information, (2) stereo audio for television, (3) stereo audio for radio, (4) audio cue circuit for television, (5) audio cue circuit for radio, (6) teletype circuit, (7) control circuit for remotely switching stations

* An outlay of at least \$5.5 billion is estimated by AT&T for new construction in 1969, according to data filed with the SEC.

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from one satellite channel to another, (8) data circuit for news and program information (to be converted to facsimile), and (9) network identification signal?

- b. Is it practical to design a satellite having a number of these channels all radiating more than 37.5 dbw EIRP?
- c. Can 15-18' diameter television receiving dishes, actually be designed to receive many channels of this information simultaneously?
- d. What are the ground interference problems with respect to ground temperature, stray microwave frequencies, the affiliate's own transmitter, weather conditions and sun reflection into small dishes?
- e. How small a receiving/transmitting dish would be required to operate in connection with a radio station?
- f. How small a ground station can be designed to operate on a transportable basis for radio?
- g. What type of satellite antenna beam patterns can be designed to provide sufficient signal strength to small areas like Hawaii and Puerto Rico?
- h. Can a single receiving dish receive channels from two satellites at once without being repositioned? Can the satellites be orbited one over the other in space?
- i. Is it practical to think in terms of a plug-in transmitter giving a station the capability to transmit and receive with the same dish at the same time?

- 2. What information about operational uncertainties is needed?
- a. The signal quality deterioration on two, three and four hops by satellite.
- b. Whether switching can be done: (1) by changing the input to a satellite channel back and forth between two transmitting ground stations, (2) at a ground station receiver between two satellite channels on the same satellite, or (3) from one satellite to another -- all without a black interval, picture roll or change of color quality.
- c. The ability of a broadcasting station's engineering personnel to operate and maintain the ground station receiver.
- d. How quickly a ground station dish can be repositioned from one satellite to another, and the new channel tuned in.
- e. How many regular and spare satellite channels will be needed to distribute television and radio broadcasts.
- 3. What information about economic and market characteristics is needed?
- a. The cost of the small receiving ground stations mentioned earlier, their operation and life, as compared with the cost of land lines to the stations.
- b. The cost of feeding signals to Hawaii, Puerto Rico, the Virgin Islands and Alaska (by special satellite antenna configurations).

. 4. Specifically, what information or technological developments are needed over the next few years with respect to trade offs among spectrum utilization, orbit location, and cost to permit maximum utilization of communication satellite capabilities?

- a. How closely can satellites be clustered in space to permit a single small ground station to operate among a large number of satellites without repositioning its dish?
- b. Can frequency spectrum be conserved in the ground station satellite links by transmitting only the television picture changes, or by using unfocused laser beams?
- c. Can improvements be achieved in picture quality by using digital rather than analog transmission techniques?
- d. To what extent can the upper limits of the present frequency spectrum be utilized for satellite transmissions?
- e. Can spectrum space be envisioned (within the ground station to satellite to ground station link) to accommodate threedimensional television in the future, disregarding for the moment how it would be broadcast locally?

5. What of the above information can be obtained best by further research, experimental trials, or a pilot operational system? NBC would have to refer this question to the broadcasting "user group", were it in operation. They, in concert with Comsat and the FCC, would best be able to negotiate the future course between costly experimentaion, less expensive research, or honest technical projection of limited data in order to arrive at an optimum design for an initial system. ITT World Communications Inc. subsidiary of International Telephone and Telegraph Corporation 67 Broad St New York NY 10004

J. R. McNitt President

Mr. Clay T. Whitehead, Staff Assistant The White House Washington, D. C.

September 19, 1969

Dear Mr. Whitehead:

Reference is made to your letter of August 19, 1969 concerning policies for the timely introduction of satellites to domestic commercial communications. We appreciate your invitation to comment on the issues you will be considering with respect to this subject.

You note that you have reviewed the public record of the last several years concerning this subject and I assume that you are familiar with the information which has been submitted to the Federal Communications Commission pursuant to their Notice of Inquiry in Docket No. 16495. However, as a matter of convenience, I am attaching copies of our filings with the Commission in that proceeding since they do continue to reflect our current ideas and information.

In brief, it is our view that whatever domestic satellite system may be authorized, the earth stations should be owned and operated by the common carriers, who are required to provide communication services to all users. This would include such specialized services as television and data systems, as well as the traditional record and voice communications services.

We believe also that the earth stations of the system should be established and operated in a competitive atmosphere with an opportunity for the existing terrestrial carriers, and such new competitive elements as may be authorized, to make use of the satellite system, as owners.

The domestic satellite system should be regulated as a part of the overall telecommunications system and should not be considered a separate technology. To be effective in serving the public interest such system must necessarily be coordinated and interlaced with landlines, microwave systems and any other existing or future media of telecommunications. It is recognized that in a competitive but regulated field it is not desirable to have unlimited competition. However, this is an area of governmental policy in which there has been substantial experience and we see no reason why the same regulatory policies should not be continued to include satellite communications, as have been developed while we were gradually adding new media to communications services over the years. Mr. Clay T. Whitehead

Certainly, a satellite system has the potential of adding to present capacity, expanding TV coverage and perhaps more effectively serving sparsely populated areas. It is a fertile field for expansion of the carrier communications networks and the development of new networks. Nonetheless, it will be important to evaluate the technical and economic alternatives in any given situation. In many cases, it may well be that expansion of terrestrial facilities in some instances would be both technically and economically preferable to the use of a satellite system.

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We have not attempted to comment specifically on the various issues enumerated in the attachment to your letter primarily because, in our view, at this stage of domestic satellite development, the answers to your inquiry must be developed over a period of time and are not readily apparent from past experience. We believe that alternative techniques in the implementation of a domestic satellite system have not been explored fully and should be prior to implementation of the system. Some techniques which deserve, in our opinion, more detailed information are unattended ground stations, truly low cost stations, uncooled receivers, satellite attitude and position control, satellite reliability, and integration of satellite transmission techniques into the general purpose common carrier domestic networks. Nonetheless, we do feel that technically satellite development is far enough advanced to permit the creation of a system without the need for entering into a pilot program.

Accordingly, it would be our recommendation that the common carriers be authorized to establish, maintain and operate at least the earth segment of a domestic satellite system, thus supporting and fostering competition through private enterprise, and with the understanding that such authorization did not create a monopoly but that such system must be made readily available to existing and new entries into the communications field. If future circumstances justify such action, such system might also be made available for specialized uses on a non-carrier basis.

We will, of course, be happy to meet with you and provide such further information or cooperate in any way possible with your Committee.

Very truly yours,

President

ENCS.

Subrussions to FCC on file me my office - WEK

Before the FEDERAL COMMUNICATIONS COMMISSION

In the Matter of the

Establishment of domestic non-common carrier communication-satellite facilities by non-governmental entities Docket No. 16495

COMMENTS OF ITT WORLD COMMUNICATIONS INC.

ITT World Communications Inc. (hereafter called "ITT Worldcom"), in response to the Commission's Notice of Inquiry captioned above, submits the following:

While this Commission is empowered as a matter of law to authorize establishment of domestic non-common carrier communication-satellite facilities by non-governmental entities, the Commission should not do so, since such authorizations would be in accord with neither the regulatory policies established by the Commission pursuant to the Communications Act of 1934, as Amended (hereafter called "the Communications Act"), nor the policies expressed by Congress in the Satellite Act of 1962 (hereafter called "the Satellite Act") and regulations adopted thus far by the Commission under that Act.

(a)

The Commission has power under its plenary control of the use of radio licenses vested in it by Title III of the Communications Act, to promulgate policies and regulations locking toward the authorization of non-governmental entities to construct and operate communicationsatellite facilities for the purpose of meeting their private or specialized domestic communications requirements. (Such facilities are hereafter referred to as "private systems"). However, the exercise of such power is subject to the statutory finding by the Commission that the public interest, convenience and necessity will be served by such authorizations. ITT Worldcom submits that the public interest, convenience and necessity will not be served by such authorizations.

The Satellite Act does not instruct the Commission as to whether or when its power to authorize the construction and operation of such private systems should or should not be exercised. Nor does it provide guidance for the Commission in determining when the public interest, convenience and necessity will be served. That Act does not, by its terms, inhibit nor does it by its terms encourage the authorization of such private systems. The focus of the Satellite Act is that of the expeditious establishment of a commercial communications system "as part of an improved global communications network..." (Section 102(a)).

Other than recognizing, in Section 102(d) that other systems than the global system might be established, the Satellite Act does not treat with systems other than the global system. Section 102(d) of the Act provides that "it is not the intent of Congress by this Act... to preclude the creation of additional communications satellite systems, if required to meet governmental needs or if otherwise required in the national interest." However, this provision of the Act does not in itself authorize the establishment of

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additional satellite systems by private entities for their private or specialized requirements. To the contrary, the legislative impact of Section 102(d) is that of <u>excluding</u> from the legislative ambit of the Satellite Act such separate, additional communications satellite systems.

The Commission's authority and responsibility in this matter is derived from the Communications Act which establishes the purpose of making available "so far as possible, to all the people of the United States a rapid, efficient, Nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges". Clearly the exercise of that authority to achieve the stated purpose miltates against the establishment of private systems if the effect would detract from the provision of adequate facilities to serve "all the people".

(b)

It would appear that authorization of domestic private systems where it is found that the public interest, convenience and necessity are thereby served, would have no more effect or impact upon the policies and goals set forth by the Satellite Act or upon the obligations of the United States Government as a signatory to the Executive Agreement establishing Interim Arrangements for a Global Commercial Communications Satellite System than would the authorization of a private domestic terrestrial microwave facility.

As we have noted, the Satellite Act establishes a policy and program looking toward creation of a global system for international telecommunications. While it is true that section 102(d) of the Act declares that "it is

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not the intent of Congress by this Act to preclude the use of the communications satellite system for domestic communications services," this declaration creates no policy that the global system should be so used. It merely establishes that it is <u>not</u> the policy of the Act to <u>preclude</u> such usage.

Similarly, the Interim Arrangements referred to in the Notice of Inquiry look toward the establishment of a global system for international communications and not toward a system which would establish domestic communications capability to provide domestic communication service within any country. Nowhere in either Interim Agreement does it appear that any of the participating nations are precluded from authorizing the establishment of independent satellite communications systems for domestic commercial use.

Article I of the Intergovernmental Agreement significantly speaks only of the global commercial communications satellite system. That article states:

"(a) The Parties to this Agreement shall cooperate to provide, in accordance with the principles set forth in the Preamble to this Agreement, for the design, development, construction, establishment, maintenance and operation of the space segment of the <u>global</u> commercial communications satellite system... (Emphasis added)

(b) In this Agreement,

(1) the term 'space segment' comprises the communications satellites and the tracking, control, command and related facilities and equipment required to support the operation of the communications satellites."

While it may be argued that Article VII of the Intergovernmental Agreement and Article 7 of the Special Agreement support the notion that the signatories agreed not to establish communications satellite facilities for domestic purposes, it is clear that those provisions are directed toward regulating access to the space segment of the <u>global</u> system.

Article VII of the Intergovernmental Agreement states:

"In order to ensure the most effective utilization of the space segment in accordance with the principles set forth in the Preamble to this Agreement, no earth station shall be permitted to utilize the space segment unless it has been approved by the committee pursuant to Article 7 of the Special Agreement."

Article 7 of the Special Agreement provides:

"(b) Any application for approval of an earth station to utilize the space segment shall be submitted to the committee by the signatory to this Special Agreement in whose area the earth station is or will be located....

"(c) Any application for approval of an earth station located in the territory of a States whose Government is party to the Agreement which is to be owned or operated by an organization or organizations other than the corresponding signatory shall be made by that signatory".

The restrictive language of Article VII of the Intergovernmental Agreement and Article 7 of the Special Agreement when read with reference to the sections of Article I, quoted above, clearly applies only to applications for use of the global system to be established. The language of those articles in no way inhibits the right of a participating nation to independently establish a domestic commercial system, provided that separate facilities are used.

(c)

As a matter of policy, it would not be in the public interest for the Commission to authorize the construction and operation of such private facilities.

(1) That the amount of frequency spectrum available for communications satellite services is limited is a matter of public record and a fact well-known to the Commission. Recently, in his testimony before the

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Senate Committee on Acronautical and Space Sciences, James D. O'Connell, Director of Telecommunications Management, noted that "Communications satellites as presently being developed are heavy consumers of the frequency spectrum and their future growth may well be limited by saturation of that spectrum." (Hearings, January 26, 1966 p. 101).

At this early stage in the development of satellite communications, it is mandatory that the future effectiveness of present media for nationwide communications be insured, including terrestrial microwave facilities. Large numbers of broadband circuits via satellite also must be reserved for the use of common carriers in order to meet future communications requirements. Television services have only begun to grow and an increase in educational use of television is making further demands on the available frequency spectrum. TV closed circuit transmission is consuming increasing capacity. The rapid development of business machines is already creating a very substantial and growing demand for channels for the transmission of data. That these services, as well as many others, will increase enormously in the future cannot be questioned. Beyond these growing existing services still other new demands for use of spectrum space must be anticipated.

From the point of view of frequency spectrum availability a determination as to whether the public interest, convenience and necessity would be served by authorization of private systems should be deferred until common carrier satellite systems have been established and the needs of the general public for all services are provided for. If, after such common carrier systems, designed to provide the full range of communication

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services and afford the benefits of lower costs of satellite technology to all users of communications services, have been established and there is frequency spectrum available, private systems might then appropriately be considered.

(2) ITT Worldcom hus no direct knowledge of the capacity of existing or planned tenestrial facilities to provide the services contemplated by those who would propose to establish private or specialized domestic satellite systems. It is apparent that all existing services are being provided by terrestrial systems and it is equally apparent, as we have noted, that virtually all forms of communications requirements are rapidly increasing. It has been characteristic of the inauguration of new capacity and services that if they provide high quality communications at reasonable rates they are quickly utilized to near capacity. The development of satellite systems certainly should permit establishment of part of the new capacity needed and the common carriers should be encouraged by the Commission to utilize such new methods of communication to meet their obligation to provide communication services to all the people.

(3) From the point of view of the economic impact of the authorizations of such private systems on the existing common carriers, such authorizations would not appear to be in the public interest. Revenues ordinarily accuring to the carriers from serving bulk users are revenues upon which they depend heavily in satisfying their need to earn an overall reasonable rate of return. The carriers must stand ready to serve all of the public who have communications requirements, both large and small,

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without favor or discrimination. Obviously from the standpoint of the costs involved, private, domestic satellite communications systems would be constructed and operated only by extremely large users, as the small users do not have requirements to justify the investment needed to construct and operate such systems. Loss of revenues now received by the carriers as a result of serving large users and loss of potential revenues from new bulk services must necessarily have the long run effect of raising the cost of serving the general public and the rates it pays. Authorization of such private systems would leave to the carriers the provision of the less profitable services, essential to the smaller users. The economic impact on the common carriers of a situation with much in common with that under discussion here was emphasized as one of the more significant reasons underlying this Commission's recent determination in the so-called "Authorized user" proceeding. (Docket #16058). Thus, it is submitted that under present conditions, private domestic communications satellite systems are incompatible with the concept of the maintenance of a sound, domestic, commercial telecommunications system and would result in serious adverse effects on the well-being of the commercial telecommunications industry.

(4) It is not believed that the authorization of private systems would serve to improve the quality of communication services provided or reduce their costs. Certainly any such potential benefit would inure only to the users of the private system and it can be predicted that quality of service and costs to the general public would be adversely affected. The common

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carrier base had many years of our signed in the connections field. The vest experience has led to many improvements in service over the years and many of these improvements did not take place overnight. Certainly it is reasonable to expect that the quality of service which might be provided by private systems will not, for some time, be technically as good as that the carriers have developed. It is probable also that at least initially, the cost of providing communication service by private systems would be more costly for the users of such systems than would be the taking of service by them from common carriers, but clearly any substantial authorization of such private systems would increase the cost of common carrier service to the general public. First of all, there would be gross economic waste in the duplication of facilities. A major aspect of the cost of a satellite system is the cost of launching the satellites. A policy of authorizing private systems can only lead to the incurring of duplicating launch costs, to say nothing of the cost of creating systems duplicating those of the common carriers. It is thus entirely possible that the total communication costs of the users of private systems might increase if they continue to use the facilities of the established carriers as well.

The desire to avoid the economic wastes of multiple utility systems and to secure the greatest public good has been a basic impetus to the adoption by legislatures of regulation as a substitute for unrestricted competition. The requirement that common carriers secure certificates of public convenience and necessity prior to establishing new facilities

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in order to avoid the costs to the public of duplicative systems would be completely undersched if this Cosmission puralited a preliferation of unregulated duplicating private systems.

(d)

ITT Worldcom does not presently have available sufficient information to determine whether it is technically feasible to accommodate all potential users of private systems. However, despite this the following comments would appear to be in order and hopefully will be of assistance to the Commission.

First, it should be observed that the only application so far filed with the Commission for the establishment of a demostic, non-governmental, non-common carrier private satellite system is that of one broadcast and television network. That application proposed satellite earth stations which would transmit programs to various affiliated stations throughout the United States, its territories and possessions, including also noncommercial educational TV stations. The Commission's Order substantially broadened the question by recognizing that the application was the forerunner of "proposals for the construction and operation of communicationsatellite facilities by entities for the purpose of meeting their private or specialized domestic communication requirements."

There is no question that limited bandwidth, power flux density limitations and earth station limitations all demonstrate that, in the present state of the satellite communication art, the number of satellite communications systems must be closely contained. Although a system

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devoted to broader at and talendrion pervices may eventually be justified, certainly 4 or 5 systems devoted to broadcast and televicion could absorb unnecessarily large segments of the available frequency spectrum. This problem would be accontuated because for obvious economic reasons each private system would be optimized to meet its particular requirement. In cases where, as in broadcast and television services, many receiving stations would be required, the system needed would be either extremely expensive or would use an inordinate portion of the allowable

earth surface power flux density.

There are many industries, in addition to broadcast and television services, which are in a degree serving various public interests. The Commission has had ample evidence of these various interests in the recent "Authorized User" proceeding (Docket No. 16058). Clearly, in the light of the diverse and highly competitive companies which conceivably have sufficient volume of communication requirement to justify economically the establishment of private satellite systems, the Commission would be faced with a serious problem as to where the line should be drawn if it countenanced the establishment of such systems. It seems apparent that the efficient application of the satellite modium to domestic communications service, in the light of the limitations of bandwidth, surface power flux density, and allowable earth terminal deployment copability, requires that the systems authorized must be so designed as to accommodate as fully as possible all domestic communication needs. This thought promptly brings to mind the policy conclusion

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that authorization to establish satellite systems should be limited by the Commission to common carriers. A coordinated service operated by authorized common carriers making optimum use of existing terrestrial and satellite facilities for all communications purposes would clearly provide the 'optimum service to the greatest number of users, to "all the people".

Bringing the benefits of satellite technology to "all the people" must be the objective of the initially established domestic satellite systems. All relevant considerations, economic as well as technical, are more appropriately met by the establishment of such systems on a common carrier basis, rather than authorizing the creation of a multitude of systems to serve private or specialized domestic communications interests.

Resptectfully submitted,

ITT WORLD COMMUNICATIONS INC.

By

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By____

John A. Hartman, Jr.

By_

Terrence L. Slater

Dated: July 29, 1966

320 Park Avenue New York, N.Y. Its Attorneys

Before the FEDERAL COMMUNICATIONS COMMISSION Washington, D.C. 20554

In the Matter of the

Establishment of domestic non-common carrier communication satellite facilities by non-governmental entities. Docket No. 16495

REPLY COMMENTS OF ITT WORLD COMMUNICATIONS INC.

ITT World Communications Inc. (ITT Worldcom) hereby submits the following Reply to the Comments of other parties filed in the Commission's above-captioned Initial Notice of Inquiry, and comments on the questions raised in the Supplemental Notice of Inquiry adopted October 20, 1966.

Comments on the questions posed by the Initial Notice were filed with the Commission by some nineteen entities, including ITT Worldcom. In its initial comments it was submitted by ITT Worldcom that as a matter of law, the Commission is empowered to authorize the establishment of domestic non-common carrier communication satellite facilities by nongovernmental entities; it was urged, however, on policy grounds that the Commission should not do so, since such authorizations would be in accord with neither the regulatory policies established by the Commission pursuant to the Communications Act of 1934, as amended (Communications Act) nor the policies expressed by Congress in the Satellite Act of 1962 (Satellite Act), and regulations adopted thus far by the Commission under the Satellite Act.

The Legal Issue

Four entities -- the Communications Satellite Corporation (Comsat), GT&E Service Corporation (GT&E), the Hawaiian Telephone Company (Hawaiian) and The Western Union Telegraph Company (Western Union) -- disagreed with ITT Worldcom's view that the Commission is empowered, as a matter of law, to authorize such private communication satellite facilities.

GT&E, Hawaiian and Western Union argued, in effect, that the Satellite Act was intended to be comprehensive legislation extending to all aspects of communication by satellite, domestic as well as international. There is nothing in the Satellite Act, they stated, which grants to the Commission any power to authorize the establishment of non-common carrier communication satellite facilities by any entity other than Comsat, or to authorize any entity other than common carriers to use such facilities in providing telecommunication services to others. In addition, Western Union argues that the concept of private domestic satellite systems is inconsistent with the terms, tenor and underlying philosophy of the Satellite Act, that the Satellite Act placed satellite radio in a legislative framework different than that of terrestrial radio, and that although section 102(d) of the Satellite Act recognized the possible use of the global system for domestic purposes, all such services must be provided by the common carriers.

Comsat went further and argued that the Commission, under the Satellite Act and the Communications Act, is not empowered to authorize any non-governmental entity (including common carriers) other than Comsat to construct and operate satellites. The Satellite Act, it stated, gave

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authority only to Comsat to construct and operate the satellite themselves, and left no discretion to the Commission. Further, Comsat argued that the legislative history of section 102(d) of the Act shows it was not intended to be a legislative grant of power to the Commission to authorize additional satellite systems, or to anyone else, but rather the establishment of such additional systems is a matter of Congressional determination.

Comsat argued that it is a unique entity, created under an Act that was carefully constructed to meet most, if not all, of the objections raised and the fears expressed by those interested in the legislation. Thus, while the carriers have heavy representation on its Board, unique safeguards against domination of Comsat by those carriers were established by the Act. Other requirements were adopted to prevent foreclosure of competition in the supply of equipment among other purposes. Other entities which seek to establish satellite systems would not be bound by such requirements. Comsat also contended that since the Act directs the National Aeronautics and Space Administration (NASA) to furnish to Comsat satellite launching and associated services, NASA is not authorized by law to provide such services for ordinary commercial systems.

ITT Worldcom urges, for the reasons set forth in its previous comments, as well as those to follow, that its views as to the legal authority of the Commission are correct and the positions of GT&E, Hawaiian, Western U

Section 102(d) of the Satellite Act specifically provides that the Act shall not preclude "the creation of additional communications

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satellite systems if required to meet unique governmental needs or if otherwise required in the national interest". Absent a section such as 102(d), it might properly be argued that since Congress provided in the Satellite Act for the creation of a global system, but then said nothing about additional systems, the intent of Congress was to preempt the field, and the authorization of any systems beyond the global system required additional legislation. However, the inclusion of section 102(d) stills that argument; Congress clearly did not intend to preclude establishment of additional systems. Since the Satellite Act and the Communications Act empower the Federal Communications Commission, in the case of the Satellite Act, to oversee the creation and regulation of the organization operating and the global satellite system, and in the case of the Communications Act, all other non-governmental domestic and foreign radio systems, it would seem evident that that Commission is the agency intended to oversee, through its appropriate licensing procedures, the formulation of any additional satellite systems, and to determine whether the national interest requires the establishment of additional non-governmental systems. There is nothing in either Act which reads against the exercise of such authority.

Similarly, Comsat's argument that the specific authorization to NASA to provide launching and associated services to Comsat must be construed as forbidding NASA to provide such services to others, thus manifesting the Congressional intention to preclude the authorization of additional satellite systems, is poorly founded. The specific directive to NASA can properly only be construed in accord with its own terms;

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it makes clear that RASA is to so serve Consat, but it is obvious error to argee that by making one such grant all offices are precluded.

With respect to Consat's contention that other entities providing satellite services might not be subjected to the safeguards and the checks and balances designed to achieve the policy aims of the Satellite Act and to which Comsat is subject. Comeat overlooks the fact that the Commission in authorizing other entities, common carrier or otherwise, to provide satellite services could do so only when such would be in the public interest, and would certainly condition any such authorization with appropriate safeguards to protect that public interest. The Commission has been long engaged in such activity -- over thirty years -- and clearly is fully qualified to judge when the public interest requires the imposition of such safeguards'.

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Finally, it should be noted that the Commission's Notice of . Inquiry was directed to the question of whether it may authorize the establishment of domestic satellite facilities. Comsat's argument is based entirely on the Satellite Act, and its legislative history. However, this Act relates exclusively to a global system, as is made clear by the inclusion of Section 102(d), -- to domestic systems. Indeed, Comsat gives tacit recognition to this fact by the complete absence of the use of the word "domestic" in its entire legal argument. Not once does this word appear. Hence, Comsat chooses to base its legal argument entirely on a statute, and the legislative history thereof, which is completely unrelated to the instent inquiry.

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Admittedly, the Satellite Act does not preclude Comsat, a global common carrier, when duly authorized by the Commission, from providing domestic communications via its global system. Comsat is precluded, however, from establishing a separate communications satellite system to provide domestic communications.

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As a unique entity created by Congress as the vehicle for effectuating the policy aims of the statute, the appropriate scope of its activities can only be determined by reference to the Act. The only powers of Comsat contemplated by Congress are those set forth in section 305(a) of the Satellite Act. Indeed, that section provides that those powers are to be exercised in a manner designed "to achieve the objectives and to carry out the purpose of this Act...." As relevant here, the powers include construction and operation of "a commercial communications satellite system." The system referred to is the global system described in section 102 of the Act with reference to Comsat in the language that "United States participation in the global system shall be in the form of a private corporation, subject to appropriate governmental regulation."

This view is buttressed by the testimony of Senator Frank Church in the Report of the Senate Committee on Foreign Relations on H.R. 11040, S. Rept. No. 1873, 87th Cong., 2d Sess., August 10, 1962, wherein, at pp. 14-15, he stated:

> "I concur with that portion of the minority views which states that the bill would delegate to a private corporation authority to negotiate international agreements affecting foreign policy, and I believe it should be amended as suggested in the minority views to cure this defect.

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"In addition, I have introduced, for myself and the senior Senator from Ohio (Mr. Lausche), an amendment to section 201(a)(6) of the bill.

"The purpose of this amendment is to make the operative language of the bill itself conform with one of its most important declared purposes. Under the 'Declaration of Policy and Purpose' of the bill, section 102(d) reads:

"(d) it is not the intent of Congress by this Act to preclude the use of the communications satellite system for domestic communication services where consistent with the provisions of this Act nor to preclude the creation of additional communications satellite systems, if required to meet unique governmental needs or <u>if otherwise required in the</u> <u>national interest</u>. (Emphasis supplied)

"The wisdom of this last clause 'or if otherwise required in the national interest' is perfectly apparent. We cannot now fortell how well the corporate instrumentality established by this act will serve the needs of our people. If it should develop that the rates charged are too high, or the service too limited, so that the system is failing to extend to the American people the maximum benefits of the new technology, or if the Government's use of the system for, say, Voice of America broadcasts to certain other parts of the world proves excessively expensive for our taxpayers, then certainly this enabling legislation should not preclude the establishment of alternative systems, whether under private or public management. And just as certainly is that gateway meant to be kept open, in case we should ever need to use it, by the language to be found in the bill's 'Declaration of Policy and Purpose' to which I have referred."

The amendment was, of course, adopted. It is clear that it was

contemplated by Congress that such additional systems as might be

authorized would not be owned and operated by Comsat.

Thus, the only authority of Comsat to operate a commercial communications satellite system relates to <u>the global system</u> which is in the process of being created by INTELSAT, the international consortium established by the Interim Agreements of August 1964. Comsat has no

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statutory mandate to construct or operate any system apart from the global system. As a creature of the Act, its powers not only flow from the Act, but are limited by the Act. Absent additional legislation, a grant of authority by this Commission to Comsat to operate a domestic communications system apart from the global network, would be inconsistent with the Act as well as its legislative history and hence of doubtful legality.

The Policy Issues

ITT Worldcom's position that the Commission should not as a matter of policy, authorize the establishment of domestic communication satellite facilities by non-common carriers has been opposed by the American Broadcasting Companies, Inc., the National Broadcasting Company, Inc., the Columbia Broadcasting System, Inc., the National Association of Educational Broadcasters, the American Trucking Association, Inc., the JFD Electronic Corporation, the National Association of Manufacturers Communications Committee, the Central Committee on Communication Facilities of the American Petroleum Committee, the United States Department of Health, Education and Welfare and the Ford Foundation.

The broadcasting entities urge the Commission to authorize the establishment of domestic non-common carrier communication satellite by non-governmental entities, alleging that there would be no adverse effect on the common carriers as only minimal revenues are received by the carriers from these services now, that the policies of competition in the Satellite Act affirmatively favor such systems, that there is a need

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to establish as promptly as possible a satellite system for the distribution of television programming on a twenty-four hour basis and that such a system would redound to the advantage of educational television, which is in the national interest.

The remaining entities also urged that there would be no adverse economic effect on the common carriers, and, further, that the users should be given the choice of making use of common carrier systems or private systems of their own. The Department of Health, Education and Welfare argued that the establishment of such systems would provide the greatest versatility in meeting the broad range of public needs, would permit service to more of the people, and improve the quality and variety of programming. The Ford Foundation proposal, which has received widespread publicity, would establish a non-profit system to serve the radio and television industry, with the savings therefrom accruing to educational television.

As ITT Worldcom has submitted in its earlier filing in this inquiry, the amount of frequency space for communication satellite services is limited. It would therefore appear to be required that before private systems which would serve the limited needs of a few users are established, common carrier systems should be put into operation, so that all of the needs of all of the people may be served.

It has been the general expectation, an expectation borne out by experience so far, that the use of satellites for communications will permit substantial reductions in charges for communications services. Accordingly, users of such services, large and small, can eventually be expected to

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seek to secure the benefits of ratellite communications. The threat major television networks have expressed such an expretation in their filings herein. Should private systems be authorized, and these users construct and operate their even communication facilities via satellites, not only will the carriers lose the terresteial business they now have, but they also will be precluded from providing these services, particularly to the large users, via common carrier satellite systems. Comments of the large users to the contrary, loss of the opportunity to serve them would be a serious loss in revenues to the carriers, which still must stand ready and able to provide all services to all users. Indeed, such a loss might well require increases in charges by the carriers to those other users.

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Several of the respondents to the Commission's inquiry have urged that the users should have the choice of using common carrier facilities or private satellite facilities. On the surface, such a request may well appear reasonable. An analysis, however, of this concept of "choice" demonstrates that the vast majority of users will have no choice at all, and that only the very few large users would have such a choice.

First, as indicated above, the number of satellite systems that can be authorized is limited. Once common carrier systems are put into operation, should the Commission then consider the authorization of additional, private systems, only a few such systems would be feasible in light of frequency systems limitations. And, secondly, the choice

will go only to the very large users, as only they will be able to justify the cost of establishing and operating such private systems. Hence, the vast majority of the using public will have no choice but to utilize common carrier systems and the capabilities of those systems might well be seriously reduced by the establishment of private systems which would absorb frequency space and diminish carrier revenue. It is for these reasons that the Commission should consider very carefully the ramifications of proliferation of satellite systems and for authorization of private systems which will surely drive skyward the charges which must be paid by those with no choice.

ITT Worldcom agrees that a satellite system which will allow more economical domestic transmission of television programming should be established as soon as is reasonably feasible, but submits, for all of the reasons set forth above, that such a system should be part of the overall, common carrier owned and operated communications sytems. In any event, because of frequency spectrum limitations, ITT Worldcom believes that the public interest, convenience and necessity demand that any consideration of authorizing private systems should be deferred until common carrier satellite systems have been established and the needs of the general public for all services have been met.

Comsat urges that authorization for domestic satellite communication systems should not be granted to entities other than itself. Authorization to Comsat to provide domestic services via satellites could only be authorized to provide such services via the global system. It should be noted that ownership of this system is not left to Comsat alone, but rather an

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organization composed of Comsat and representatives of other countries. Revenues derived from ownership and operation of the global system are shared by the various owners in proportion to such ownership. Thus, were the global system to be used for communication between, for example, Miami and St. Louis, revenues obtained from such a purely domestic United States service would be syphoned off to foreign entities. This would be in sharp contrast to the present worldwide practice of domestic services being provided by the domestic carrier with the revenues therefrom being retained by such domestic carrier. Similarly, control over major decisions with respect to the handling of domestic traffic should not be accorded to an international consortium.

It is submitted that the Commission should rule, as a matter of policy that domestic communications by satellite shall be provided initially by the United States domestic carriers, using systems which they own and operate, to the exclusion of non-governmental private parties and Comsat.

The Ford Foundation Proposal

The Ford Foundation urges that a new company be established to own and operate a domestic satellite system as a common carrier to serve radio and television networks. It proposes to use revenues derived from such common carrier service to support an expanded educational television network. The proposal is advanced as a remedy for the present inadequate educational television service resulting from insufficient financial resources. Additional funds are required to

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provide more and better programming, to meet production costs and to provide additional outlets throughout the country. Live national noncommercial television service would be expanded, supported in part by revenues obtained from the countercial networks, under the Ford Foundation proposal.

Although ITT Worldoom recognizes the desirability of an educational television system that is more extensive and economically sound that presently cutate, we believe that the method of achieving this goal is a matter which should be the subject of Congressional consideration with the policy decision to be made thereafter by the elected representatives of the people, and not by the Commission as a regulatory agency in the context of construing the legal and policy issues presented in this proceeding. However, as an aid to that legislative consideration, it is submitted that the Commission might appropriately express views on those aspects of the Ford Foundation proposal which are poculiarly within its realm of authority and expertise. Among those matters are the following:

First, the proposal would create still another common carrier, albeit one with an extremely limited service offering. It is submitted that the existing carriers are quite competent and prepared to provide a satellite system capable of providing for the economical distribution of television and radio broadcasting, as well as for all other common carrier services and that no need has been demonstrated for the establishment of a new cander.

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Second, the proposal envisages that a large part of the revenues obtained by the proposed new common carrier would be devoted to programming and other production costs, rather than being dedicated to the establishment and operation of the common carrier system created for the distribution of programs. It is submitted that such a diversion of communication revenues, or to put it another way, the inclusion in charges for communications services of such a tax, is inconsistent with fundamental notions of rate regulations and should be rejected. Legislation might be adopted requiring the existing networks to subsidize the educational networks, but such subsidization should be directly related to the need and not "piggy backed" on communications charges.

Whatever domestic satellite system is authorized and developed, it is expected to reduce substantially transmission costs for television and radio programs. Although the Ford Foundation proposal suggests reduced transmission costs as against present terrestrial means, it would require the creation of two systems: one for television and radio transmission only, and the second for the other common carrier services. This obviously would result in higher overall costs and charges than would a single system which would be used for all forms of communications. The existing domestic common carriers have indicated their willingness to provide a satellite system to meet all of the communication requirements, television, radio broadcast and other, of all of the users.

Third, the proposal raises the question as to whether at this stage of the satellite art and in the light of frequency spectrum limitations, a satellite system dedicated solely to television and radio broadcast

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services is technically feasible without imposing undesirable restraints on the use of satellites for broader public uses. It is submitted that the overall public interest requires that priority be given to the establishment of a common carrier system and that private systems be considered only after firm conclusion on the technical feasibility of additional systems have been reached on the basis of experience with the common carrier systems. Of significance in coming to a conclusion as to priority, is the fact that the common carriers have stated that they are prepared to provide the service needed for all users, including the television and radio broadcast interests, at reasonable charges.

The Ford Foundation, as well as the Carnegie Commission on Educational Television, have urged that no decision be reached by the Commission which would preclude the subsequent authorization of a domestic satellite system for educational television. ITT Worldcom endorses that suggestion. If in the future it becomes clear that domestic satellite systems for limited purposes can be justified technically and economically, the authorization of such systems might then be appropriately considered by the Commission. We see no need, however, to delay the development of a common carrier domestic satellite system which would provide for the needs of all the people for all communication services.

With respect to the Supplemental Notice of Inquiry adopted October 20, 1966, ITT Worldcom submits the following:

(a) ITT Worldcom is not a domestic common carrier and
 hence at this time has no plans to use communication satellites
 to meet domestic needs. It may well be concerned, of course,

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• with the potential use of satellite earth stations and systems for combined domestic and international use in the future.

(b) ITT Worldcom's position is contained in its August 1, 1966 Comments, as well as in its Reply Comments to the Commission's Initial Inquiry. As set forth therein, ITT Worldcom submits that, as a matter of law, there is no restriction on the Commission's power to authorize any communications common carrier or carriers to construct and operate communications satellite facilities for domestic communication facilities.

(c) (1)-(5) As ITT Worldcom is not a domestic carrier and hence is not in a position to comment on the matters raised in these items.

(d) As indicated in its August 1, 1966 Comments, ITT Worldcom submits that the Commission has authority under present statutes to license an entity offering the service contemplated by the Ford Foundation; however, for the reasons contained therein, and in its above Reply to the Commission's Initial Notice of Inquiry, ITT Worldcom submits that the Commission should not do so in the absence of specific legislation as such authorization

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would not be in accord with the regalitory policies heretofore established pursuant to the Communications Act or the Satellite Act.

Respectfully submitted,

ITT WORLD COMMUNICATIONS INC.

B Howard 1 By John A. Hartman, Ĭr. B١ Teri

Its Attorneys

Dated: December 15, 1966

320 Park Avenue New York, New York 10022

CERTIFICATE OF SERVICE

I, Agnes H. Boolbol, do hereby certify that a copy of the foregoing "Reply Comments of ITT World Communications Inc." was mailed, postage prepaid, this 15th day of December, 1966, to the following: $21 \times T$ $T_{max}^{(m)}$, $T_{max}^{(m)}$, $T_{max}^{(m)}$, $T_{max}^{(m)}$

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FURTHER REPLY COMMENTS OF ITT WORLD COMMUNICATIONS INC.

ITT World Communications Inc. (ITT Worldcom) hereby submits the following Further Reply Comments to the Replice of other parties, including, in some cases, initial Comments, filed in response to the Commission's above-captioned Initial Notice of Inquiry, as well as the October 20, 1966 Supplemental Notice of Inquiry.

The Initial Notice

In its Reply Comments, ITT Worldcom urged, as it had in its initial comments, that as a matter of law, the Commission is empowered to authorize the establishment of domestic non-common carrier satellite facilities by non-governmental extities. It was urged further, however, "" that the Commission not grant such authorizations, as a matter of policy, since such authorizations would be inconsistent with the regulatory policies established by the Commission pursuant to the Communications Act of 1934, as amended, the policies expressed by Congress in the Communications Satellite Act of 1962, and the regulations and opinions promulgated by the Commission thus far under the Satellite Act.

It is submitted that the legal analysis and recooring advanced

by PTT Worldcom stand unimpugned, indeed not seriously challenged by the submission of others in this proceeding.

However, ITT Worldcon's view that as a matter of policy, the Commission should not authorize the establishment of domestic communication satellite facilities by non-common carriers has been opposed by the broadcasting entities, the educational television entities, the Arts end Sciences Foundations, and the aeronautical and newspaper entities. All of these entities, in one form or another, urge that the Commission not preclude the establishment of private systems to meet private needs.

Additionally, varied proposals for domestic satellite communication systems have been submitted by the Communications Satellite Corporation (Comsat), the Ford Foundation (Ford), and the American Telephone and Telegraph Company $(MT \& T)^1$. The Ford plan has been somewhat technically revised from its proposal of August 1, 1966, but is essentially unchanged, i.e., that a new company be established to own and operate a domestic satellite system as a common carrier to serve radio and television networks, and that the revenues derived therefrom be used to support an expanded educational television network. Comsat has urged that it alone should be authorized by the Commission to provide domestic satellite communication services, proposing a plan to serve the needs of all users, broadcasting and others. AT&F proposed a system serving all users, with Comsat owning the satellite themselves, and the domestic carriers owning the ground stations. GT&E Service Corporation would appear to favor a plan similar to that proposed to AT&T.

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^{1/} The Western Union Telepraph Company previously filed applications with the Commission, recurcing authorization for a depended satellite system for its own use, which applications it incorporated by reference in the instant docket.

ITT Worldcon submits, first, that a demestic satellite system devoted solely to the broedcasting industry is not in the public interest from either a technical or economic point of view, and second, that Consat should not be accorded a monopoly over domestic satellite communications. Rather, ITT Worldcom urges that a plan similar to that proposed by AT&T should receive serious consideration by the Commission since it would provide a domestic satellite communications sytem which would best serve the public interest, convenience and necessity. The implementation of this proposal would provide to all users the economies of a domestic satellite system and by permitting the existing domestic common carriers to participate in providing communications services via satellite facilities, would be a means of smoothly integrating such new facilities for use in providing existing communication services.

ITT Worldcom adheres to its previously expressed view that the Commission should not consider the authorization of the establishment of private systems to meet private needs until there is established and operating a domestic common carrier satellite system serving all users, a facility which no party to this proceeding has denied is necessary and desirable in the public interest.

However, ITT Worldcom respectfully submits, as set forth on pages 3-8 of its December 15, 1966 filling in this proceeding, that as a matter of law Comsat may not at this time, without additional legislation, be authorized by the Commission to operate satellites which are not a part of the global system contempleted by the Satellite Act to provide domestic communications service. As is domenstrated in that earlier filling, the provisions of the Satellite Act to provide domestic

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make it clear that the Congress did not intend that any additional systems that the Commission might authorize would be owned by Cons. 4, and that the authority given to Comsat relates solely to the global system. Accordingly, in order to implement a domestic satellite contaunications system similar to that proposed by ATET, legislation authorizing Comsat to provide the satellites therefor must be sought and obtained from the Congress.

The Supplemental Notice

With respect to the issues raised by the Commission's Supplemental Notice of Inquiry of October 20, 1966, ITT Worldcom reaffirms its position as set forth in pages 15-17 of its December 15, 1966 filing in this matter.

Respectfully submitted,

ITT WORLD COMMUNICATIONS INC.

By Howard By

John A. Hartman, Jr. By Terrence L. Slater

Its Attorneys

Dated: March 31, 1967

320 Park Avanue New York, New York 10022

CEPTUICATE OF SERVICE

1, Mary Jane Pilocco, do hereby certify that a copy of the foregoing "Further Roply Comments of ITT Vorld Communications Inc." was mailed, postage prepaid, this 31st day of March, 1967, to the following:

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William E. Seward, Esq. Thomas R. Matias, Esq. The Western Union Telegraph Company 60 Hudson Street New York, New York 10013

Mary Jane Pilocco

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March 31, 1967

Petere the PEDERAL COMBTUNEATIONS COUNTRESTOR Washington, D. C. 2055.

In the Matter of

Istablishment of domestic nor)
common carrier communication)
satellite facilities by non-)
governmental entities.)

Docket No. 16495

COMMENTS OF ITT WORLD COMMUNICATIONS INC. ON THE ADDITIONAL COMMENTS OF THE GENERAL ELECTRIC COMPLEX

In accordance with the Commission's Order of Pelaucry 23, 1969 in the above-captioned proceeding, ITT World Communications Inc. (ITT Worldcom) hereby submits the following Comments on the Additional Comments of the General Electric Company dated February 19, 1969.

IfT Worldoom has read with great interest the Additional Comments of General Electric in this matter. They involve a far reaching and highly imaginative plan, some aspects of which, if effectuated, would appear to provide possibilities of revitalizing the descentic record message and data industry. General Electricuis to be contached for the obvious effort it has put into this matter and for arriving at a proposal which is both morel and thought-provoking. If Worldoom, however, has several brief comments on the matters contained in the General Electric filing.

The Commission will recall that in our three previous filings in this matter, ITT Worldcom urged that, as a matter of law, the Commission is enpowered to authorize the establishment of demestic non-common carrier satellite facilities by non-governmental entities, but that the Commission should not grant such authorizations, as a matter of policy, since such would be inconsistent with the regulatory policies established by the Commission pursuant to the Communications Act of 1934, as amended, the policies expressed by Congress in the Communications Satellite Act of 1962, and the regulations and opinions premulgated by the Commission thus far under the Satellite Act. In its Additional Comments, General Electric appears to be in accord with ITT Worldcom's legal position, and thus we feel no need to further comment on that aspect.

ITT Worldcom did not address itself to the question of the Commission authorizing additional common carriers to provide services via domestic satellites. However, although General Electric takes no final position on the question, it advocates that serious consideration should be given to the creation of a new entity to handle domestic record domestic matching via domestic ratellite and microwave systems, and thus complete with the established domestic common carriers. Iff Worldcom public spectfully disagree with

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General Electric's position on this point, as we believe, for all of the reasons previously stated, which we will not repeat at length herein, that any dementic satellite system can and should be owned and operated by the existing common carriers, which have experience gained during many years of providing such services. Constal Electric has made no showing of any need for the establishment or authorization of additional common carriers. Further, record services of the type proposed by General Electric should be integrated with those provided by the facilities of the existing carriers so that a composite rate structure can be developed which will support all media used for domestid record services.

General Electric's Additional Comments do not appear to advocate the establishment of domestic non-common carrier satellite systems and thus ITT Worldcom will advance no further comments on that subject at this time.

General Electric also recommends that one entity should own the domestic satellites, the domestic earth stations and the switching center. We note that the Additional Comments of General Electric do not constitute an application for authority from the Commission to construct a demestic system of any type. ITT Worldcom feels that it is premature for the Commission to make any decision at this time as to whether these facilities should be

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owned by a single entity, as such decision would be made in a vacuum, absent relevant data which would necessarily be contained in any formal application filed with the Commission.

ITT Worldcom appreciates the opportunity offered by the Commission to comment on the Additional Comments of Ceneral Electric.

Respectfully submitted,

ITT WORLD COMMUNICATIONS INC.

By Howard J. Aibg'l

By John K. Hartman,

By ico Terrence L. Slater

Its Attorneys

Dated: April 11, 1969

320 Park Avenue New York, New York 10022 -4--

OBRIDDONDLOU SUPVICE

I, Joanne E. Burke, do hereby certify that a copy of the foregoing "Comments of ITT World Communications Inc. on the Additional Comments of the General Electric Company" was mailed, postage prepaid, this 11th day of April, 1969, to the following:

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Joanne E. Burke

April 11, 1969

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UNIVERSITY COMPUTING COMPANY

executive offices: 1300 Frito-Lay Tower Dallas, Texas 75235 214 / 350-1211

September 25, 1969

Mr. Clay T. Whitehead Staff Assistant The White House Washington, D. C.

Dear Mr. Whitehead:

We were very pleased to receive your letter of August 19 asking for our ideas on the timely introduction of satellites to domestic commercial communications. I hope our response will be helpful to your working group.

The attached comments were not designed to be an overview of the entire domestic satellite area. We are sure there are others more qualified than we to comment on the broad perspective of possibilities for plans of implementation. We have attempted to highlight salient policy implications of data communications for introduction of domestic commercial satellites, as we see them.

I understand our Assistant General Counsel, Martin Hoffmann, has been in touch with you regarding your meeting with the personnel of Microwave Transmission Company for amplification of our comments. Again, I hope we will have been of assistance to you in the difficult task you have in formulating this very critical policy.

Very truly yours,

UNIVERSITY COMPUTING COMPANY

Charles J. Wyly, Jr. President

CJWJr:dk

UNIVERSITY COMPUTING COMPANY'S COMMENTS ON THE INSTITUTION OF

A DOMESTIC COMMERCIAL SATELLITE COMMUNICATIONS SYSTEM

I. INTRODUCTION

University Computing Company's interest in Domestic Commercial Satellite Communications Systems is based on its interest in data communications. UCC presently is a major data transmission customer of the communication facilities of existing common carriers. UCC's future growth and development in the electronic data processing industry is dependent on the growth and development of the nation's data communications capabilities.

UCC has since its founding been based on the "computer utility" concept. This mode of computer time-sharing and remote-batch data processing keys on its ability to provide customers with computing services at or near customer locations by means of remote terminals. Thus, UCC has had a wealth of practical experience in the data communications field. UCC has had regular contacts with and thorough familiarity with the capabilities of existing common carriers through its communications subsidiary, Microwave Transmission Corporation, which has secured installation of communications systems for the company for the past three years. Moreover, the staff of MTC has had wide experience in advanced communications systems, including the manned spaceflight network, installation of the Defense Department's Autodin network and such public applications as ticket reservations systems for major airlines, and the like.

Accordingly, UCC's comments in this memorandum are based on its past experience, its projections of future needs and its evaluation of the policies and capabilities of existing carriers.

II. DATA COMMUNICATIONS

As used in this memorandum, data communications refers to the transmission of information between two computers, or between a computer and a remote computer terminal. While other forms of communications of information--such as xerography and teletype--are sometimes included in the broad generic category of "data" transmission, and while the same techniques

that will be most effective for "pure" data communications may be applied to them with increased efficiency, the basic analysis can most easily be made in terms of the essential requirements for communications between electric data processing machines.

Computers and the terminals to which they relate almost universally operate in a digital mode. The information content is expressed in a coded series of electrical pulses or "bits", of which there are only two varieties--"on"or "off". To send a character, such as a letter of the alphabet or a number, a series of eight bits is required, each series containing a distinctive combination of "off" and "on" bits. Thus, a communications line that can transmit 2400 bits per second can transmit 300 characters per second.

The telecommunications facilities available today in the public network have been developed primarily for the transmissions of speech and sound, and operate in an <u>analog</u> mode. The engineering techniques for analog transmission have been developed over a number of years so that the public communications network is able to transmit with remarkable precision a nearly lifelike replica of the many and varied sounds that make up the human voice. However, the data communications user, in order to use the present analog public communications network, must use a signal converter or "modem" (modulator-demodulator) to convert the electrical pulse of the computer into a sound. Once converted, this sound can travel through a channel of the public communications network, following which it must be converted at the receiving end by another modem into the digital "language" of the computer. This conversion process is costly, and in conjunction with other characteristics of analog transmission, produces a number of impediments to effective data transmission.

Contributors to the Computer Communications Inquiry before the Federal Communications Commission--including UCC--underscored the leading drawbacks of the existing analog public communications network for data communications, as follows:

1. Error Rate:

While current information is not available, the reliability of the public switched network of the telephone industry is generally quoted as one error in every 10-4 bits transmitted. Under such circumstances a customer can expect an error in transmission on the average of every four seconds. This degree of reliability is sufficiently low that in most cases, data communications customers must use terminals with some form of error detection and correction capability.

2. Connect Time:

The present average connect time in the public switched network is approximately 20 seconds or more. Man-machine oriented systems of the inquiry type--check clearing, airline reservations and the like--average 2.3 seconds for the inquiry portion and 6 seconds for the reply portion of a total 8.3 second transaction. Until the connect-time is reduced to be less than the transaction time, full utilization of such systems--as one example--will never be fully possible over the switched network.

3. Speed of Transmission:

The maximum data transmissions speeds attainable over the switched voice network is 2000 bits per second. As a practical matter, the maximum private line capability over these same facilities is 4800 bits per second. Even small computers generate data at speeds upward of 9600 bits per second; larger machines, such as the Univac 1108's used by UCC can generate data at speeds ranging up to 100 million bits per second. Thus, there is a requirement for a switched capability which makes available channels of varying capacity to allow transmission at the varying speeds required by individual users.

4. Stable, Predictable Performance:

A number of factors contribute to the wide range of variations in the performance (in terms of speed, error incidence, and connect time) of one circuit or the next using existing facilities. The capability to detect or insure a circuit which meets predetermined standards of performance not available in existing networks.

In view of the foregoing, UCC foresees the need for a national all-digital communications system oriented to data communications. Such a data-dedicated system even utilizing state-of-the-art technology would reduce to manageable proportions or eliminate the foregoing shortcomings of existing communication capability, and probably do so at reduced data communications costs. Ultimately, with the volume of data communications almost universally predicted to exceed the volume of voice communications in the 1980's, UCC is convinced that the construction of a national digital communications network--either by existing carriers or a new communications entity--is only a matter of time.

III. COMMUNICATIONS SATELLITES AND DATA TRANSMISSION

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UCC knows of no specific domestic services that can be provided by a satellite system, that are not now available over terrestrial communications systems or that which would not be made available over land-based systems within the same time frame. It is true that certain remote areas in our country present difficulties in satisfactory provision of certain communications services-other respondants to your investigation may provide additional information in this respect. UCC's comments below will be confined to communications requirements of data communications users as they relate to the possible use of satellites.

There are various plans proposed for development of communications satellites for domestic use and various methods considered for accessing the communications channels of those satellites. Each method has its own merits, but as far as UCC is aware, all proposals for message traffic (including data transmission) contemplate use of existing switching and local loop distribution facilities. The data communications user would not benefit significantly from any sophistication in satellite transmission techniques as long as he is limited to the capabilities of the existing local plant. For the immediate future, therefore, most of the disadvantages of existing telecommunications capability would inure to a satellite system.

The question of actual cost-saving to the user through satellite utilization also appears uncertain due to this dependance on existing local loop capability. There are many authorities that minimize the costs involved in actual long distance transmission, as separated from local distribution and switching systems costs.¹ For example, Mr. Earl Hilburn, Vice President of Western Union in an address to the EIA Satellite Communications Seminar in Los Angeles in October, 1967 is quoted as follows:

"... Western Union's annual operating expenses in 1966 totaled \$306 million. Of this amount, only \$29 million was in intercity transmission facilities. So, even if we were able to eliminate completely all costs associated with intercity transmission facilities -- and this is obviously impossible -- it would only reduce our annual operating expense by less than ten per cent..."

Some of the switching systems required by the more sophisticated satellite link proposals require elaborate ground stations and could add significantly

¹Address by Gen. J. D. O'Connell, Dir. Telecommunications Management at NEREM '67 Boston, Mass., November, 1967. to costs. In this connection, problems of interface of these new routing systems with existing terrestrial systems must be carefully planned to insure that total systems integration is attained at the lowest possible cost.

Problems existing in data communications which have been summarized above would be complicated by the inclusion of satellite technology in the present system. Error checking is a good example though various techniques exist, most terminals operating today utilize a relatively simple and low cost method of parity checking wherein each block of information is transmitted, and a verification from the receive terminal is required before the next block or message segment is transmitted. Propagation time, or time of transmission is highly significant, considering the time required to transmit a block of information, receive verification of correct receipt and then transmit the next segment. This time delay is in the order of 15 microseconds per mile over terrestrial circuits or about 45 milliseconds for a typical transcontinental connection.

The replacement of terrestrial long-distance trunks with a satellite link adds 45,000 miles to the transmission distance involved. In consequence, the propagation time is increased by over an order of magnitude. To illustrate this effect: UCC demonstrated the use of satellite communications in December, 1967, in a circuit arranged between Dallas, Texas, and London, England. The communication carrier advised UCC that the propagation time would be in the order of one-half second, which was born out in the actual tests. Even though the connection was successful, the actual throughput--2400 bits per second-was no more than that obtainable on conventional switched-service lines even though the input transmission bit-rate was doubled to 4800 bits per second in the test.

Even in applications involving low terminal sophistication, the use of a satellite link could create problems. In time-sharing applications a typical system includes a computer accessed by remote, low-speed keyboard terminals. Conventionally, these terminals have no or limited capability for error checking, other than visual check by the operator. To provide this capability, the trend today requires an operational split between terminal keyboard and printer. When the user types a character on the keyboard, the signal first is transmitted to the central computer where it is entered into input storage; at the same time the signal is repeated back to the terminal where it is printed by the typewriter printer. While there is a finite time required for this transmission, on terrestrial circuits even of reasonable length, the delay problem is not serious. The delays of one second or more which would be introduced with satellite links would introduce severe operating problems even though technically the transmission was feasible.

These problems ultimately will be overcome by use of forward-error correcting equipment and more sophisticated terminals. The cost of this equipment is presently prohibitive for the user with modest transmission requirements. It well may be, however, that given new all-digital techniques, the error problem--even with satellite--links can be reduced to a manageable level of performance.

Reliability is a present problem. There is little information available as to the up-time reliability of satellite links. While the satellites are generally expected to be fairly short-lived, (five years) and replacement planned accordingly, there have been some notable satellite failures even before that expected life had been attained. The most recent example was the Atlantic Intelstat failure just before extended television coverage of the Prince of Wales investitute resolution of which required some extraordinary action on the part of COMSAT. While failures on terrestrial links do occur, these systems can be engineered to very high up-time criteria so that, short of major catastrophic events, restoration time can be relatively short and data or other message loss held to a minimum. Because of time required for replacement, however, the unexpected failure of a communications satellite could cause a severe impact on communications, even though elaborate alternate routing plans were developed. At least for the foreseeable future, the data communications user must be provided an option for terrestrial long-distance communications.

Satellite communications links do appear to have immediate areas of possible advantage even under the constraints outlined above. Economical and reliable communications to relatively remote areas which have limited communications requirements appears advantageous. Terrestrial systems constructed to service so-called "thin routes" (in terms of channel density) are expensive. Satellite links operate at an advantage economically over these same routes since satellite utilization in effect negates the distance factor. Moreover, actual communications market appraisal and development is possible through satellite application without precommittment of expensive terrestrial plants. Significant savings in these applications could overcome some of the technical disadvantages outlined above as trade-offs.

The answers to many present problems can be provided by a controlled test. With sufficient constraints to insure that the data communications user will not be penalized either in terms of cost or operational capability, UCC enthusiastically supports a test program for domestic communications satellites.

IV. DOMESTIC SATELLITE: GENERAL POLICY

Communications technology advances continuously and dynamically, if not slowly. UCC believes that technological innovation should be encouraged and that an environment of competition in which regulation is limited to the minimum necessary to protect the public interest will encourage the most rapid innovation and new, balanced development of national communications capability.

In the interest of efficiency and competition, the time tested principal of specialization should be maintained to the extent possible. The advent of new technology--such as satellite technology--should be regarded as an opportunity to promote new and beneficial competition in areas where--for whatever reason--competition has not existed before in meaningful degree. In short, technological advances such as satellites should be received into the existing framework of communications capability in such a way that they will produce maximum innovation, to the ultimate benefit of communications of consumers and the public as a whole.

Notwithstanding the present close relationship between satellite and existing communications facilities, there is no question that once a domestic satellite is in place, and assuming that there is wide latitude for innovation in its utilization, satellite can be a stimulus to the communications industry. Presently, complex earth stations are required for satellite use. Unquestionably, and particularly given a situation of ready access, it may be possible to reduce the size and increase the number of these stations, even to the point where the individual home may have the capability of direct satellite access. In connection with earlier remarks on foreseeable data communications use of satellite, it is certain that the anticipated shortcomings of satellite data communications can be overcome. Timely development can and will come to pass if the marketplace is given a vital role in determining what the developed uses of the satellite technology will be.

Based on UCC's experience, if control of the satellite development and utilization is left in the hands of existing carriers to be integrated into their existing capabilities, development of satellite technology will be aimed at suiting the convenience of the carriers and not necessarily responding to the requirements of the marketplace and the needs of the public. Insuring a policy of access and innovations will insure maximum public benefit from space-age satellite technology.

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JOSEPH A. BEIRNE, President



Workers of America

(AFFILIATED WITH AFL-CIO) 1925 K STREET, N.W. WASHINGTON, D.C. 20006 TELEPHONE: FEDERAL 7-7711

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September 17, 1969

File: 3.3.6 x 3.1 x 3.

Dr. Clay T. Whitehead Staff Assistant The White House Washington, D. C.

Dear Dr. Whitehead:

Thank you for your letter of August 19, inviting comments on the subject of establishing a domestic communications satellite system. Since receipt of your letter, my staff and I have engaged in numerous wide-ranging discussions of the implications of a domestic satellite system.

Although your letter said your working group expects to complete its work about October 1, I should hope that any decisions arrived at will be only tentative.

Thanks to the genius of the American economic and political system, we have the technology in mid-1969 to establish a communications satellite system; the system could be operational within a relatively short time. The question of how to <u>develop</u> such a system has been resolved; the many questions involving how best to <u>utilize</u> a domestic communications satellite system appear a long way from resolution.

This anomaly is typical of the long history of mankind. Policy and law throughout history generally have lagged behind technology. For example, the dawn of international flight was in July 1909, when Louis Bleriot flew his tiny aircraft across the English Channel; in those intervening 60 years, the questions of use of another nation's airspace have been reviewed and the concepts codified many times. While the first wartime use of atomic energy was in August 1945, 18 years elapsed before the nations of the world were to take the first limited step in setting limits on the use of that form of energy.

The first confrontation with the need for policy and law in the use of extra-terrestrial space occurred late in 1957, when the Soviet Union orbited its Sputnik, to mark the real opening of the Space Age. The last 12 years have pointed to the need for international agreements to provide for the proper use and prevent the abuse of space technology.

One of the most promising uses of space technology is improvement and expansion of the media of communications. We have no clear idea where this use of space will lead.

The appropriate national policy, in my view, ought to be one which:

- -- Fosters the maximum development of a domestic communications satellite system in the shortest possible time;
- -- Preserves as a public trust the right of all citizens to enjoy the benefits of a domestic communications satellite system;
- -- Assures that all potential users, especially educational and other public broadcasters, will have free access to the system;
- -- Allows the companies providing communications service on a common carrier basis to make the many valuable and essential contributions of which they -- and they alone -- are capable;
- -- Fits into the international agreements now under consideration within the International Telecommunications Satellite Consortium (Intelsat), so that a United States domestic system does not in any way prevent optimum performance of the global system;
- -- Provides for logical use of the broadcast spectrum;
- -- Leads toward establishment of the necessary corporate, legal, financial and operating structure of the entity which eventually is charged with providing the domestic communications satellite services to the Nation.

The key thought in my mind, in considering your questions, was that we must make haste slowly. By that I mean that we must move ahead rapidly with technological development; there must be no fence lines erected around an ever-expanding technology. I foresee some danger in establishing at this time what you have termed "institutional arrangements" in the series of question areas. I believe this is the only area in which a cautious, conservative approach is dictated.

As you are aware, this organization was among the leaders in promoting passage of Public Law 87-624, the Communications Satellite Act of 1962.

The Communications Satellite Corporation (Comsat), established pursuant to the terms of the Act, has undertaken a mammoth task of managing the global system. Comsat is providing communications services on an international basis, but is encountering numerous problems never envisioned when the 1962 Act was under consideration by the Congress.

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I am aware that Comsat has requested authority to inaugurate the domestic communications satellite system. I am constrained to raise several questions as to whether Comsat alone would be the proper entity charged with the task.

First, the job of providing international service should continue to be the major task of Comsat, for some considerable length of time after the Intelsat agreement is put into final form. This Corporation must devote its major energies to this prior long-term commitment and work at resolving the problems connected therewith.

Second, Comsat's economics would seem not to be able to furnish the information necessary to formulate a true rate-base for services. One of Comsat's continuing problems is the low level of usage of its facilities by the common carriers. Without a level of usage more nearly commensurate with the actual capacity of Comsat's facilities, revenue and cost data provided cannot be considered reliable.

Mr. A. Bruce Matthews, Vice President and Treasurer of Comsat, told the FCC last May that Comsat would be able to add 48 kHz services with "essentially zero" costs. The reason given by Mr. Matthews was the unused capacity on existing Comsat satellites and the expectation that the situation would continue well into the future.

Third, Appendices 10 and 11 of the 1968 Comsat Report to the President and Congress indicate that assets and revenues tend to distort the rate base. Specifically, Appendix 10 shows total revenues of \$39,069,000 of which \$8,574,000 (or 21.9%) is composed of interest from temporary cash investments. Appendix 11 shows total assets of \$256.4 million, of which \$132.3 million (or 53.7%) is in cash and temporary investments. In other words, Comsat derives a significant portion of its income from arbitrage, an endeavor somewhat remote from the function of providing communications carrier services.

Fourth, Comsat has not established a pattern of paying dividends. One of the criteria of a "going concern" is the reward of investors.

None of the foregoing should be construed as outright criticism of the Comsat operation; instead, the comments are to point out the salient problems that have faced this Corporation. In my view, the main problems of Comsat have been imposed on it from without, i.e., the common carriers intended to be served by Comsat and by Federal Communications Commission rules. In the light of a few years' experience, Comsat has been unable to reach its potential because of artificial strictures, of which we in the communications field have become aware.

The domestic system eventually established must not only draw on the experiences of Comsat but must be closely coordinated with Comsat. The structure of whatever entity is created must take this need into account.

While we discuss a "domestic" communications satellite system, we cannot fail to consider the wide international implications of the system.

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Under present technology, synchronous satellites must be in equatorial orbit about 22,300 miles above the earth. This fact places a practical upper limit on the actual number of satellites that can be in use in the Western Hemisphere. Already, the Department of Defense has put its own satellites in orbit, as does the National Aeronautics and Space Administration. These are in addition to the Comsat/Intelsat satellites. I am aware of the ongoing debates as to the minimum distance between satellites necessary to obviate interference.

Because space belongs to all of mankind and because the United States must continue to be a "Good Neighbor" to the other nations of this hemisphere, the band above the equator must be usable by others. The final Intelsat agreement, now in preparation, undoubtedly will provide the framework for logical position allocations.

Another problem area suggests itself here. The establishment of a domestic communications satellite system brings the United States a large step closer to the eventual reallocation of the broadcast spectrum --- which again becomes an international consideration to be decided through the International Telecommunications Union.

Ambassador William W. Scranton, Chairman of the United States delegation to the Intelsat Conference, pointed out the international implications of a domestic system in his letter of June 12 to Senator Mike Gravel of Alaska.

Since the Canadian Parliament's passage in June 1969 of an act to establish a Canadian domestic satellite system (Telesat), the Canadian Government has been at work to employ the technology. I understand a part of the Canadian system will be in operation in 1969.

The many filings in FCC Docket No. 16495, detailing the intended uses of and services to be offered by a domestic communications satellite system, suggest the following to me:

- 1. Capability is presumed; ability to apply this technology and the necessary equipment are in existence now.
- 2. Most or all of the filings indicate that there is taken a too-limited view of the possibilities. The only approach that seems logical to me is to have the widest possible array of services offered via satellite.
- 3. Allowing one company or a limited group of companies to be in charge of development might lead to retardation of full development of a program. There could be serious questions of anti-trust law applicability. However, their contributions would be both unique and essential.
- 4. A full-scale pilot program using a domestic satellite system is needed forthwith. In order not to lock-in any structural arrangements, a temporary operating entity should be established. (Please see NOTE)

NOTE: At this point, I offer a clarification of terms, in order not

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to have my position misunderstood. The words "pilot" and "experimental" in connection with domestic satellite system use are not limited to technological development. The two Applications Technology Satellites already in use by NASA, together with the three others due to go into orbit within the near future, can be suitable for pilot program use. Various scientific experiments using the ATS units now are in progress.

My proposal amounts to a greatly expanded trial of these existing facilities to resolve the important questions of how best to utilize satellites. This would be the only logical means of helping to learn the economic, legal and structual implications in a domestic satellite program. I would strongly advocate offering these ATS satellites for maximum service in the trial period; full traffic loads should be placed on the system to learn and demonstrate its capabilities in a multi-use operations.

Because of the long lead time and the high costs, I do not advocate putting up satellites specifically for use in a pilot program. These would be redundant.

- 5. Experience gained from a pilot operational program should be thoroughly analyzed before a permanent legal structure is devised.
- 6. The entity to operate the domestic satellite system should be akin to Comsat, and established pursuant to the authority of the Congress. The legislative history thus created could ensure that satellites in domestic use would adequately serve the demands of national security, industry, commerce, and dissemination of information through commercial and public broadcasting. Of particular interest at this time is the experimental Post Office Department-Western Union service, in which satellite links could prove valuable.

At this point, let us assume a pilot system is authorized. The operating committee to take charge of all phases of the pilot system would be chosen on the basis of two criteria: ability of the individuals to cooperate, and representation of all viewpoints and interests.

Thus the operating committee could include:

- -- Government representatives from the Federal Communications Commission, National Aeronautics and Space Administration, Office of Science and Technology, Office of Telecommunications Management, U.S. Office of Education, Anti-Trust Division, Department of Justice, and Department of State.
- -- Common carriers (voice, record, data, etc.)
- -- Comsat

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- -- Broadcasters (networks and Corporation for Public Broadcasting)
- -- Educators

-- Other "users" of communications services (with "users" taken in broadest sense)

This broadly based operating committee could evaluate the potential of a domestic satellite system and could develop the structure of the entity which would take on the permanent task of system operation. This committee would provide for an orderly transition from the temporary or "pilot" stage into the permanent operation; among its chief duties would be developing concepts and language for any needed legislative authority and FCC rulemaking.

Because NASA now is operating research satellites, I would suggest that NASA be designated the project leader during this trial period. A time limit for evolution of the permanent system's structure should be imposed, and enforced if possible.

Above I suggested the entity charged with operating a domestic satellite system might be modeled on Comsat. While I am hesitant to set out the specific form this entity would take, its prospects of success will be enhanced by its ability to ensure maximum availability and accessibility to users of communications services. It must be free of artificially erected barriers to offering a full range of services. In addition, the interests of the common carriers (ranging from compatibility of equipment to tariffs) must be protected, and the legal structure ought to encourage carriers' use of the domestic satellite system.

The Corporation for Public Broadcasting would be greatly assisted by use of satellites for interconnection; some of the channels in a domestic system should be reserved for CPB's use at no cost. There are two main reasons: currently the land-lines system in use by CPB is subject to pre-emption at the last moment, and interconnection service fees make up a major line item in the CPB budget. The money thus freed could be spent by the Corporation for program development. The FCC in April authorized interstate common carriers to provide interconnection service at no cost to CPB, and to charge any added costs to the operating expenses of interstate service. Despite this, the Corporation is being forced to face a major rise in interconnection costs, apparently due to a misunderstanding of the recent FCC ruling by the common carriers. The concept of no-cost interconnection for CPB must be clarified and reiterated. CPB's contribution to the betterment of life for all of our citizens is unique and vital; CPB's development must be fostered by making its offerings available to as many communities as possible. Use of the satellite for interconnection can help accomplish this and at the same time remove some of the overload from the common carriers' land lines. American Telephone & Telegraph Co. has informed CPB and FCC that it must build more facilities to meet CPB's anticipated service needs.

I have reviewed Chapter 5 of the Rostow Report, dealing with a domestic satellite system. I find many points of both agreement and disagreement with the recommendations.

As is clear from some of my foregoing statements, I would prefer to amend these words, on page 3 of Chapter 5:

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"We (Rostow Task Force) recommend as the most prudent course a modest operational pilot domestic satellite program, with Comsat playing the leading role, as a logical first step."

My amendment would have Comsat playing <u>a</u> leading role. The basis is that the full range of options would remain open during the trial period. Were Comsat or any other company to be assigned <u>the</u> leading role at the outset of the trial period, there is a possibility that institutionalized arrangements would be directed into an already existing form; a free-ranging analysis of experience might point to other arrangements as more logical. In any case, however, Comsat's contribution in a leading role would be essential. NASA and the Department of Defense also have experience in the use of satellites for communications.

Some of Chapter 5 can be misinterpreted. The words "monopoly of the space segment" and "ownership" of the space segment could connote more than ownership of the hardware projected into space. But international law has not sufficiently evolved the proprietary interests in space. As I noted before, a synchronous satellite must be placed above the equator, which does not pass through any part of the United States. Even the issue of "ownership" of the space over individual nations has not been fully confronted: many satellites ---including those for intelligence purposes --- are orbiting now, but no nation has taken action to remove them from orbit. Practice and precedent thus far have pointed toward non-particular ownership of space, as of the high seas.

If "ownership" or "monopoly" of the space segment applies merely to the equipment, then the question of access must be determined.

Access is under practical control at several points: the terrestrial facilities of the satellite system and the ground links of the common carriers. The legal structure of whatever entity is created must resolve the questions of accessibility and availability. Given the right circumstances, common carriers would have the power to regulate traffic sent via satellite; a satellite system either would thrive or languish.

Does the new entity become a domestic common carrier, treated for tax and tariff purposes as other communications carriers? If so, it becomes entitled to a stated rate of return on investment.

In order to earn sufficient revenues, this satellite entity must be allocated fee-paying traffic. Then the question arises as to who shall allocate traffic between land-line and satellite systems.

The Rostow Report suggests several directions for structure. One is "to retain for public or quasi-public ownership, on a permanent basis, the space segment alone of any domestic satellite system. Carriers and private entities would be authorized to construct and operate earth stations working with the satellites. They would obtain basic transmission capacity from the satellite operator."

I must argue against public ownership for several compelling reasons: the United States has the best communications system in
the world, because the privately owned companies providing the service have the economic incentive. Service and incentive have proven their inseparability. Public, i.e., government ownership of the satellite system does not promise to me any improvement.

> The approach I favor would be investment and ownership by the public, with the common carriers somewhat more limited in their ownership of shares of stock than in the case of Comsat. Other businesses who would be the users of the service should be allowed a high degree of participation. Ordinary citizens should be able to own most of the stock, possibly as much as 60%. The enabling legislation and FCC rules would encourage use of the satellite system, so that operating profits could be made. Costs of putting satellites into orbit would be reimbursed to the Federal Government, as in the case of Comsat.

> The traffic loads generated in the trial period would assist in determining whether each satellite would be a "general purpose" unit or "dedicated" to certain purposes. This is one of the major unresolved questions cited in the Rostow Report.

Finances of a domestic satellite system are a major consideration. The trial and permanent system arrangements should be different.

In the trial period, costs connected with use of the ATS satellites (which course I would prefer) could be determined and repaid to NASA by the users of the service. Since NASA has a wide mandate, its authority to engage in studies of all aspects of scientific application including economic should pose little problem. NASA need not be and would not become a Government agency in competition with private enterprise. The President, the Congress, industry, this Union, and the American people never would consent to that type of permanent arrangement. The kind of sale of service by NASA that I envision on a temporary basis would be somewhat akin to the sale of materials by the Atomic Energy Commission for authorized scientific purposes.

For the permanent system, I believe a Government-sanctioned corporation operated for profit could provide the best service.

There would be many problems --- possibly insoluble --- connected with a linkup of government and privately owned facilities in a domestic system. Government policy should be one of fostering development of the system instead of operating it. It is possible that operational studies may point to the Federal Government as a <u>part</u> owner of the system. A strong government role could be designed to ensure adequate regulation, proper use of the system, and a beneficial degree of competition. A significant government role could be to ensure full exploitation of a domestic satellite system for public broadcasting.

If a corporation is formed to operate the domestic satellite system, the Board of Directors should be representative of the same interests as in the pilot system (listed on page 5) operating committee. The system must become another of the "natural monopolies" due to spatial and spectrum allocations. The corporation would be primarily the custodian of a natural resource used in a monopoly situation. While the industry alone could not fulfill the job of custodian, industry's participation is essential. Industry does not speak with one voice, and therefore the interests of all parties including industry must be considered.

Perhaps the corporate entity devised to operate the domestic satellite system would have these powers:

- -- Placing the satellites in orbit through NASA on a reimbursement basis, and operating the ground stations.
- -- Collecting the revenues from common carriers and users.
- -- Leasing circuits on each satellite in the domestic system. Parties should be common carriers, such as AT&T, General Telephone & Electronics, Western Union, and other telephone and telegraph companies; users of communications service, such as computer/teleprocessing companies and broadcasters, commercial and public.
- -- Allocation of circuits on the basis of usage and need. The rationale is that common carriers would not be able to dominate, own, or control the elements of technology which permit the full use of space. The danger of retarding the advance of technology would thereby be minimized, since the companies leasing the circuits would be free to use -- or not to use -- the circuits for which they had contracted, and could perform experiments within their allocated channels.
- -- Providing free interconnection to the Corporation for Public Broadcasting by reserving channels.

I am certain that the legislative and rulemaking processes can confront the issues involved here and resolve them to the benefit of the public, the companies and the economy.

A domestic satellite system formed along the lines I suggested above need not disrupt operations of common carriers; this system could supplement their facilities. The common carriers have done such a job of selling and providing service that their systems are being taxed with demand --- and the demand trend continues upward.

The carriers' problem of providing adequate facilities is made more difficult by at least two factors, which I will cite briefly:

- The record high costs of money. Southwestern Bell Telephone Co. last week sold a 36-year, \$150 million debenture issue at an interest cost of 8¹/₄%, a new peak for an AAA-rated security.
- Recruitment and retention of top-quality personnel. This is one of the key factors in the New York City telephone crisis, which has led to the company's borrowing 1,500

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communications workers from other AT&T operating companies for a crash program of telephone plant expansion.

In summary, I believe the United States Government ought to move toward establishing a domestic satellite system within the near future. The Government's dominant role should have a fixed time limit. The corporate entity taking over management of the system should be useroriented. Access to the system should provide for the minimum disruption of the common carriers, whose services are essential. Private enterprise should carry forward development of the new technology, without artificial impediments.

I am grateful for the opportunity to offer views on this subject, and offer this organization's further cooperation.

Sincerely yours,

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Joseph A. Beirne President

ELECTRONIC INDUSTRIES ASSOCIATION



2001 EYE STREET, N. W. WASHINGTON, D. C. 20006

659-2200

August 20, 1969

GEORGE D. BUTLER PRESIDENT

> Mr. Clay T. Whitehead, Staff Assistant, The White House, Washington, D. C.

Dear Mr. Whitehead:

Thank you for your August 19 letter regarding the introduction of satellites to domestic communications.

Member-companies of our Association are extremely interested in this subject and we have several task forces at work in areas closely paralleling some of the issues which you are considering. Your letter and invitation is most welcome, and I can assure you we will be in touch with you shortly with what I hope will be constructive inputs.

Sincerely,

GEORGE D. BUTLER President

ELECTRONIC INDUSTRIES ASSOCIATION



2001 EYE STREET, N. W. WASHINGTON, D. C. 20006

September 19,1969

659-2200

Mr. Clay T. Whitehead Staff Assistant The White House Washington, D. C.

Dear Mr. Whitehead:

The Satellite Telecommunications Subdivision, Industrial Electronics Division, Electronic Industries Association, has read with considerable interest the list of comprehensive questions attached to your letter of August 19, 1969. The subject of the domestic satellite system is indeed a complex one, and has been studied by many groups over the past decade. We would urge that further answers to the comprehensive questions be developed in parallel with a rapid implementation of a domestic satellite system. In this way, we benefit from the use of the system, and also would have available the results of operational experience. This parallel study and development would ensure, in our opinion, a more efficient and effective national satellite system.

As before, the Satellite Telecommunications Subdivision urges there be no further undue delay in the implementation of the domestic satellite system. Indeed, the subdivision urged, as early as March of 1968, in a widelydistributed policy statement, that the U. S. lose no time in implementation of a domestic communication of satellite systems.

We wish to emphasize the technology of a domestic system is well in hand. This is already demonstrated by successful satellite telecommunications. Last year, among a number of contributions to the successful and growing satellite telecommunications technology, Electronic Industries Association prepared a major study, "Future Communications Systems Via Satellites Utilizing Low-cost Earth Stations," (copy enclosed). This report, done by an Ad Hoc Committee of the Satellite Telecommunications Subdivision, was sent as an additional submission to the President's Task Force on Communication Policy on July 19, 1968.

We hope the enclosure will be of some aid in your deliberations. Again, we urge prompt action on this important segment of U. S. telecommunications policy. We appreciate the opportunity for comment and continue to offer our assistance in any way you might consider of help.

Sincerely,

John Sodolski Staff Vice President Industrial Electronics Division

John Gayer, Chairman Satellite Telecommunications Subdivision Industrial Electronics Division

Plan now to attend: EIA FALL CONFERENCE, CENTURY PLAZA HOTEL, LOS ANGELES, OCT. 6-9

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