

Comsat

June 19, 1970

Dear Mr. Charyk:

The President has asked that I thank you for the copy of the Annual Report on the Activities of the Communications Satellite Corporation. You can be proud of the accomplishments that COMSAT has made in the short time since it has come into existence. I hope you will pass on to your Board of Directors and employees our sense of pride in your accomplishment.

Sincerely,

Peter Flanigan
Assistant to the President

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

cc: Mr. Flanigan
Mr. Whitehead ✓
Central Files

CTWhitehead:ed/jm

14.
COMMUNICATIONS SATELLITE CORPORATION

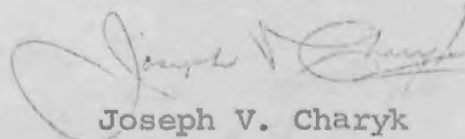
JOSEPH V. CHARYK
President

June 3, 1970

My dear Mr. President:

H
Pursuant to the Communications Satellite Act of 1962 (Title 4, Section 404(b)), I am herewith submitting the Annual Report on the activities of the Communications Satellite Corporation.

Respectfully yours,


Joseph V. Charyk

The President
The White House
Washington, D.C.

Consent

ANNUAL REPORT ON ACTIVITIES AND
ACCOMPLISHMENTS UNDER THE
COMMUNICATIONS SATELLITE
ACT OF 1962

MESSAGE

FROM

THE PRESIDENT OF THE UNITED STATES

TRANSMITTING

THE SEVENTH ANNUAL REPORT ON ACTIVITIES AND
ACCOMPLISHMENTS UNDER THE COMMUNICATIONS
SATELLITE ACT OF 1962



FEBRUARY 26, 1970.—The message and accompanying papers referred
to the Committee on Interstate and Foreign Commerce and
ordered to be printed with illustrations

U.S. GOVERNMENT PRINTING OFFICE

41-413

WASHINGTON : 1970

ANNUAL REPORT ON ACTIVITIES
ACCOMPLISHED UNDER THE
COMMUNICATIONS SATISFACTION
ACT OF 1952

MESSAGE
FROM
THE PRESIDENT OF THE UNITED STATES

TO THE SENATE AND HOUSE OF REPRESENTATIVES
IN CONJUNCTION WITH THE COMMUNICATIONS
ACT OF 1952



IN CONJUNCTION WITH THE COMMUNICATIONS
ACT OF 1952, THE SENATE AND HOUSE OF REPRESENTATIVES
HAVE REQUESTED THE PRESIDENT TO SUBMIT AN ANNUAL
REPORT ON THE ACTIVITIES ACCOMPLISHED UNDER THE
ACT OF 1952.

WASHINGTON, D. C.
JANUARY 1953

LETTER OF TRANSMITTAL

To the Congress of the United States

On July 20, 1969, from the Oval Office in the White House, I spoke by telephone with Neil Armstrong and Edwin "Buzz" Aldrin on the surface of the Moon. This historic event was also telecast and relayed to the world through the network of communications satellites. Almost twenty years after the Communications Satellite Act of 1962, I am pleased to see that our first satellite reports on the progress that helped bring this historic event to millions of people throughout the world.

Communications between Earth and the Moon, while certainly the most dramatic use of satellite technology, is only one of the many in which satellite communications will help to improve the lives of people.

CONTENTS

	Page
Letter of transmittal by the President of the United States to the Congress.....	(v)
I. Introduction.....	1
II. National activities.....	3
III. The International Telecommunications Satellite Consortium (INTELSAT).....	4
IV. Progress in establishing and operating the global system.....	6
V. Summary.....	9
Appendix A—Progress chart.....	11
Appendix B—Global system (MAP).....	faces p. 12
Appendix C—Growth in operational capability.....	12

(iii)

The White House
February 26, 1970

Richard Nixon

CONTENTS

Letter of transmittal by the President of the United States to the Congress	(v)
I. Introduction	1
II. National realization	3
III. The International Instrumentation Society Convention	5
IV. The International Instrumentation Society Convention (INTIS-67)	7
V. Progress in realization and operating the global system	9
VI. Summary	11
Appendix A—Program chart	13
Appendix B—Global system (GMS)	15
Appendix C—Charts in operational use	17

LETTER OF TRANSMITTAL

To the Congress of the United States:

On July 20, 1969, from the Oval Office in the White House, I spoke by telephone with Neil Armstrong and Edwin Aldrin on the surface of the Moon. This historic event was simultaneously televised to the world through the medium of communication satellites. Under Section 404(a) of the Communications Satellite Act of 1962, I am sending to the Congress this seventh report on the program that helped bring this historic event to millions of people throughout the world.

Communications between Earth and the Moon, while certainly the most dramatic use, is only one of many ways in which satellite communications can now be employed. The International Telecommunications Satellite Consortium (INTELSAT) of more than 70 nations has been highly successful in bringing the benefits of communications satellite technology to the people of many nations. This report reflects the steady progress being made toward an improved global communications network. Already we see major improvements in international telecommunications capabilities—improvements that will ultimately benefit all of the world's people.

The Communications Satellite Act speaks of the contribution to be made to "world peace and understanding" by a commercial communications satellite system. Just as this technology has enabled men to speak to each other across the boundary of outer space, so, I am convinced, satellite communications will in future years help men to understand one another better across boundaries of a political, linguistic and social nature. World peace and understanding are goals worthy of this new and exciting means of communication.

RICHARD NIXON.

THE WHITE HOUSE
February 26, 1970.

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Richard Nixon

The White House
February 26, 1970

I

INTRODUCTION

Background

Through the Communications Satellite Act of 1962, the Congress of the United States enunciated national policy "to establish, in conjunction and in cooperation with other countries, as expeditiously as practicable a commercial communications satellite system as part of an improved global communications network, which will be responsive to public needs and national objectives, which will serve the communication needs of the United States and other countries, and which will contribute to world peace and understanding." The Act also declared it to be United States policy that "in order to facilitate this development and to provide for the widest possible participation by private enterprise, United States participation in the global system shall be in the form of a private corporation, subject to appropriate governmental regulations." The Communications Satellite Corporation (COMSAT), incorporated in the District of Columbia on February 1, 1963, has served to carry out the intent of the Congress.

Prior to development of communication satellite technology inter-continental telecommunication services were provided by high frequency radio and submarine cable. The classical institutional arrangements for such service were established bilaterally between United States communication common carriers and those of foreign nations.

The advent of communication satellites with their potential for enhancing international telecommunications presented a challenge to the ingenuity of the United States and the international community to establish arrangements designed to yield the greatest benefits. Rather than choosing to continue the bilateral approach, it was decided that new institutional arrangements involving a multilateral agreement with a large number of nations was the more desirable alternative.

Summary of progress

During 1969 progress continued to be made by the INTELSAT Consortium in establishing and operating the Global Commercial Communications Satellite System. In five and one-half years INTELSAT has grown from an initial membership of 11 participating nations to its year-end membership of 70 nations. A progress chart showing the various programs contributing to the establishment of commercial communications satellite services is shown in Appendix A. The locations of the satellites and earth stations of the Global System are shown in Appendix B.

Significant milestones in 1969 were the successful launching of two INTELSAT III series satellites, a new generation of improved operational satellites; and the design and development by industry of the more advanced INTELSAT IV series satellites. The Global System

has experienced a steady growth in use of the available capacity of the space segment. The space segment facilities of the Global System continued to provide high quality telephone, telegraph, television and related services. Eighteen additional earth stations were activated in various countries during the year. With the initiation of commercial service via the INTELSAT system to the Indian Ocean basin and the Near-East, global coverage was achieved. Users of the system have thus obtained improved international telecommunications. For example, the National Aeronautics and Space Administration used leased INTELSAT facilities as a portion of its total telecommunications network supporting the APOLLO manned space operations. It is estimated that half a billion people watched the APOLLO 11 astronauts on the Moon via television relayed by satellites.

Evaluation of accomplishments

There have been major technical and institutional accomplishments since enactment of the Communications Satellite Act of 1962. These have provided improved international telecommunications throughout the world. The basic goal established by the Congress has been largely achieved—far more rapidly than was expected. Major milestones in the development of the global system include:

Establishment of the Communications Satellite Corporation in February 1963.

The International Agreement Establishing Interim Arrangements for a Global Commercial Communications Satellite System on August 20, 1964.

Operation of the first commercial communications satellite (EARLY BIRD) June 1965.

Achievement of global coverage by the INTELSAT System in July 1969.

In evaluating this progress, it must be noted that not only advanced nations but also many of the developing countries have planned and installed earth stations to make use of this new mode of telecommunication. The rapid establishment of the space segment and growth in numbers of earth stations have meant that for the first time, particularly in the developing areas of the world, high quality, reliable, and reasonably priced international telecommunication services have become available. Furthermore, the live distribution of television over transoceanic regions has become routine.

The progress which has been achieved with the first three generations of operational commercial communication satellites represents a profoundly important step toward a new order of capability for worldwide communication. This progress enhances the process of establishing worldwide interconnection of all modes of telecommunication and thereby increases the possibilities for the enrichment of mankind through the sharing of knowledge. Future accomplishments will be limited only by the imagination, skill, and cooperation of the nations participating in this challenging venture in space.

There are additional tasks ahead, however, if the full range of goals established by the Congress are to be met. Continued concern for the interaction of policy, planning and technology will be needed to bring the benefits of communications by satellite to more of the developing areas of the world, particularly to the centers of low-density traffic.

Further attention is also needed to expand the range of telecommunication services by applying in progressively greater measure the potential of communication satellite technology.

One of the important unfinished tasks ahead is to complete the INTELSAT Conference and to reach agreement with our partners on the Definitive Arrangements for INTELSAT. The United States' objective is to build upon the solid accomplishments of the Consortium since the Interim Arrangements were established in 1964.

II

NATIONAL ACTIVITIES

The keynote of the United States' activities in satellite communications is the mutual support and cooperation demonstrated by the United States Government-Industry team, coupled with the enlightened international cooperation by the members of INTELSAT. These joint efforts enabled INTELSAT to move rapidly toward its goals of establishing a successful international commercial enterprise, and of increasing the participation of the partner nations in research, development and manufacture in this new field of technology.

There follows a summary of significant activities during 1969 in furtherance of our national communication satellite policy; and of the concurrent planning which has been undertaken to maintain the rapid pace of progress in satellite technology and its adaptation to the needs of modern society.

Federal coordination and planning

The Director of Telecommunications Management and the Department of State, in coordination with the Federal Communications Commission, continued active participation in fulfilling Executive Branch responsibilities assigned to the President by the Communications Satellite Act of 1962.

The principal activities of the Director of Telecommunications Management and the Department of State in this functional area during the year included:

Providing policy guidance to COMSAT, acting as the United States representative in meetings of the Interim Communications Satellite Committee (ICSC), of INTELSAT.

Participating in the work of the United States Delegation to the Plenipotentiary Conference on Definitive Arrangements for the International Telecommunications Satellite Consortium, initially convened on February 24, 1969.

Maintaining continuous review of all significant phases of the development and operation of the Global System including activities of the Communications Satellite Corporation, particularly with regard to INTELSAT III and IV satellites.

Helping attain efficient use of the electromagnetic spectrum and technical compatibility of communication satellite systems with existing telecommunication facilities.

Collaborating with other interested agencies and departments (including the Department of Transportation, the Federal Aviation Administration, the Federal Communications Commission

and the National Aeronautics and Space Administration) in national planning and development with regard to use of satellites for aeronautical purposes.

Federal support

The National Aeronautics and Space Administration (NASA) continued to provide launch vehicles and launch services on a reimbursable basis for placing INTELSAT satellites into transfer orbit for the Consortium, through COMSAT serving as Manager for INTELSAT; and to provide technical advice and assistance to COMSAT, as well as technical advice to the Federal Communications Commission.

The principal activities performed by NASA in this functional area during the year included:

- Launching additional INTELSAT III series satellites.

- Providing technical consultation service to COMSAT in a number of instances. NASA made its experience available to COMSAT in connection with various aspects of spacecraft technology, and spacecraft under design, development and test.

- Continuing to furnish technical advice and comments to the Federal Communications Commission (FCC) on a number of applications filed by COMSAT and on other matters in respect to satellite communications and earth stations.

- Making available for commercial purposes and on a reimbursable basis during the year television relay services via the Applications Technology Satellites ATS-1 and ATS-3.

III

THE INTERNATIONAL TELECOMMUNICATIONS SATELLITE CONSORTIUM (INTELSAT)

Membership

INTELSAT continued to grow during 1969, increasing its membership and extending services to new areas. The addition of seven members during the year brought total membership in the Consortium to 70 countries. The new members are: Cameroon, Guatemala, Ivory Coast, Jamaica, Luxembourg, Nicaragua, and Republic of Viet Nam. In addition, the following eight countries have obtained allocated quotas and can accede at any time: Bolivia, Democratic Republic of the Congo, Costa Rica, Dominican Republic, Ecuador, Honduras, Paraguay, and Trinidad and Tobago.

The interest and active participation of so many countries in establishing a viable and useful Global Commercial Communications Satellite System is an indication of the promise of this new mode of communications for providing improved international telecommunication services.

Interim Communications Satellite Committee (ICSC)

The ICSC, as governing body of the organization, continued its normal bi-monthly meeting schedule for the purpose of planning and directing the development and operation of the INTELSAT system. The Committee dealt with a wide variety of issues and problems during the year, including among others:

- Approval of certain design and engineering changes in the INTELSAT III satellite series and for ordering additional satellites.

Approval of the exercise of options under the INTELSAT IV satellite procurement contract for the purchase of additional satellites.

Approval of launch arrangements and contracts relating to INTELSAT III and INTELSAT IV series satellites.

Continual review and revision of contingency plans for operation of the space segment of the global system.

Renewal of the service contract with the National Aeronautics and Space Administration to extend NASCOM communication services in support of the APOLLO program until September 1970.

Establishment of policy relating to conditions under which INTELSAT inventions and data can be utilized by Signatories for communication satellite systems, including earth stations.

Continual review of INTELSAT's user charges including consideration of the method of charging for multi-destination television transmissions.

Approval of new earth stations to work with the space segment of the Global System.

Determination of technical compatibility between the INTELSAT existing and planned space segment and the proposed domestic communications satellite system of Canada.

Appointment of a new panel of legal experts from which presidents of arbitration tribunals will be selected.

Coordination with the International Civil Aviation Organization to discuss possibilities and implications of the establishment of an aeronautical communication-satellite service.

Definitive Arrangements for INTELSAT

Pursuant to the terms of Article IX of the 1964 Intergovernmental Agreement Establishing Interim Arrangements for a Global Commercial Communications Satellite System, the Government of the United States convened a conference in Washington, D.C., in February 1969 to consider definitive arrangements for the global system. The Plenipotentiary Conference on Definitive Arrangements for the International Telecommunications Satellite Consortium met in Washington for four weeks, recessing on March 21, after establishing a Preparatory Committee to carry forward the work of the Conference.

The Conference Plenary was participated in by sixty-seven of the then sixty-eight member countries, by observers from twenty-nine non-member countries, and observers from the UN Secretariat and the ITU. Of this total of ninety-eight delegations to the Conference, about forty-five participated in the work of the Preparatory Committee. The Preparatory Committee met in Washington, D.C., for four weeks during June and July, for three weeks during September, and again for more than three weeks in November and December to try to resolve differences of views and formulate draft agreements.

The Conference Plenary is now scheduled to reconvene in Washington, D.C., on February 16, 1970, to consider the Preparatory Committee report and complete work on Definitive Arrangements for INTELSAT.

IV

PROGRESS IN ESTABLISHING AND OPERATING THE GLOBAL SYSTEM

Background

The Global System has grown steadily since operations began in June 1965. The market for international services by satellite consists of requirements of the international telecommunication carriers.

An overview of and the progress made by INTELSAT toward establishing and operating the Global System can be seen in Appendices A and B.

Conceptual framework of the Global System

Communication satellites placed in synchronous altitude equatorial (geostationary) orbit provide a unique transmission medium for all types of telecommunication services. Essentially, the synchronous altitude equatorial corridor—when active repeater communication satellites are employed—is virtually a 22,300 mile high ionospheric belt which can be exploited to extend the range of telecommunication capability. The fundamental attributes of this revolutionary mode of communications include an unprecedented degree of *versatility* and *flexibility* together with *high capacity* that can be achieved at economically viable costs per channel.

The INTELSAT system is based on the deployment of a relatively few high performance geostationary communication satellites so located in orbit as to provide essentially global coverage. The specific configuration of the Global System is achieved by placing the individual satellites so as to optimize the coverage in (a) the Atlantic Ocean Basin, (b) the Pacific Ocean Basin and (c) the Indian Ocean Basin. All satellites after INTELSAT I (Early Bird) have multiple access capabilities which enable several earth stations to use a single satellite simultaneously. A system with these coverage and operational features enhances the availability of the satellites to a maximum number of nations.

Technical control of the INTELSAT satellite operations, orbit positioning and monitoring of the satellites status is accomplished from a select number of tracking, telemetry, command and monitoring (TTC&M) earth stations comprising a system control network.

Space segment development

The INTELSAT system is based on an integrated systems approach in both systems design (configuration) and management in the establishment and operation of the system. Since a few geostationary satellites allow extensive geographic coverage, global in scope, the institutional arrangements of INTELSAT provide an opportunity for applying an orderly and integrated systems approach to the design of the system. The current configuration of the INTELSAT system with the present operational satellites is shown in Appendix B.

Operational satellites

The operational system of 1969 consisted primarily of INTELSAT III series satellites with secondary reliance on the INTELSAT II satellites and the single INTELSAT I (Early Bird) satellite:

INTELSAT I (Early Bird).—The first INTELSAT satellite, Early Bird, positioned in geostationary orbit over the Atlantic Ocean was retired from service on January 20, 1969, and used as

an in-orbit spare. This satellite had provided regular commercial service between North America and Western Europe since June 28, 1965. Early Bird was placed back into commercial service for a short period from June 30, 1969 to August 17, 1969, when difficulty was experienced with the INTELSAT III (F-2) antenna.

INTELSAT II Series.—Two of the three INTELSAT II series satellites successfully launched during 1967 were in service at the end of the year. The INTELSAT II (F-3) satellite positioned over the Atlantic has been used during most of 1969 to provide service between North America and Ascension and Grand Canary Islands as well as to the NASA APOLLO Tracking and Data Acquisition Ship in the Atlantic. This satellite was also used for service during the failure of the Atlantic INTELSAT III Satellite. The Pacific INTELSAT II (F-4) satellite is used to provide part of the commercial service between the U.S. mainland and Hawaii.

INTELSAT III Series.—During 1969 two INTELSAT III series satellites were successfully launched and placed into geostationary orbit. Another INTELSAT III satellite was launched in July but failed to reach orbit due to a malfunction of the third stage of the Delta launch vehicle. The two satellites launched this year plus the satellite successfully launched at the close of 1968 has allowed an INTELSAT III satellite to be positioned over each of the three ocean areas, Atlantic, Pacific, and Indian.

One portion of one of the amplifiers in the Indian Ocean satellite has failed, requiring earth stations to transmit greater power. Overall quality and maximum capacity has not changed, however, and the satellite continues to provide full-time service.

The Atlantic satellite has provided for most of the Atlantic Basin traffic during 1969, but it experienced antenna problems from June 29, 1969 to July 28, 1969 during which time it was not able to carry any traffic.

Technical modifications have been made on subsequent satellites in this series. For example, the INTELSAT III satellite which is positioned over the Pacific Ocean has not experienced any difficulties since being launched and continues to provide the majority of commercial service in the Pacific region.

Advanced Satellites.—The next generation of satellites, the INTELSAT IV series, is under construction and is scheduled for launching beginning in 1971. The original contract, placed in October 1968, called for delivery of a prototype and four flight models. A contract option for two additional flight models was exercised in October 1969. Another option for two additional flight models was exercised in December 1969. The Atlas Centaur was selected during 1969 to be the launch vehicle for the INTELSAT IV series satellites.

Satellite Operation Capabilities.—There has been a substantial growth in the size and performance characteristics of the INTELSAT satellites from the first generation model Early Bird. The principal features and operational capabilities of the various types of INTELSAT satellites are shown in Appendix C.

Tracking, telemetry, command, and monitoring

Overall operational control of the INTELSAT system is accomplished by specialized stations which perform tracking, telemetry, command and monitoring (TTC&M) functions. These stations track

the individual satellites in the INTELSAT system, receive telemetry data which indicate the performance and status of the satellites, and transmit commands which control the various on-board communications and position keeping equipment. The TTC&M stations are operated under lease or other arrangements with INTELSAT.

The TTC&M stations at Andover, Maine; Paumotu, Hawaii; and Fucino, Italy, were placed in an operational status prior to 1969. A new station located at Carnarvon, Australia, was placed into operational status during 1969.

Earth stations

The year 1969 saw the largest annual increase in the number of operational earth stations in the history of INTELSAT. Eighteen new stations became operational. New earth station antennas were placed into operation in the following countries: Argentina, Australia (Carnarvon No. 2, Ceduna), Bahrain, Brazil, Canada (Mill Village No. 2), Republic of China, France (Pleumeur Bodou No. 2), Germany (Raisting No. 2), Indonesia, Iran, Japan (Yamaguchi), Kuwait, Lebanon, Morocco, Peru, United Kingdom (Hong Kong), and the United States (Guam).

At the close of the year, 41 earth station antennas were in operation in 24 countries. Nine other stations or additional antennas are expected to be in service within the first six months of 1970. They are located in the following countries: Colombia, East Africa (Kenya), Italy (Fucino No. 3), Greece, India, Malaysia, Republic of Korea, Spain (Buitrago No. 2), and Thailand (Si Racha No. 2). In addition, nine more stations are expected to be placed in operation during the latter half of 1970. One of these stations is to be located at Talkeetna, Alaska, located about 90 miles north of Anchorage. This station is scheduled to begin commercial operation by July 1, 1970.

Utilization of the space segment

Each satellite in the INTELSAT system is accessed by a group of earth stations as listed in Appendix B. The utilization of the INTELSAT satellites increased from a total of 75 two-way voice circuits provided at the end of 1965, to 1416 circuits by the end of 1969. The growth in utilization of the operational satellites is shown in Table 2.

TABLE 2.—GROWTH OF UTILIZATION—THE INTELSAT SYSTEM

Year ending	1965	1966	1967	1968	1969	1970 estimate
Number of operational Intelsat satellites.....	1	1	4	4	5	5
Satellite utilization, percent of rated capacity ¹	31.3	35.8	53.3	74.9	44.4	37.8
Number of leased 2-way voice circuits (all classes of terminals).....	75	86	344	560	1,416	2,877
Number of operational earth station antennas (includes NASA terminals).....	5	12	15	23	41	57

¹ "Utilization in percent of rated capacity" figures include the effect that some nonstandard earth stations are less efficient in utilizing satellite capacity.

The higher capacity Intelsat III series satellites and the increasing number of operational earth stations throughout the world made possible the dramatic increase in voice traffic utilization in 1969.

The transmission of television via the Intelsat satellites has increased from approximately 40 hours in 1965 to approximately 760 hours in 1969.

Use by NASA

The NASA Operational Communications System began using commercial satellite service for APOLLO support in February 1967, and the use of the INTELSAT service continued throughout 1969.

The APOLLO manned flights conducted in 1969 included the use of satellite service to the three instrumentation ships outfitted for direct communications via communication satellites of the INTELSAT system. This provided the APOLLO Mission Director in Houston, Texas, a capacity to effect real time direction of the orbiting APOLLO spacecraft.

Special events

The unique capability of communication satellites to transmit live television broadcasts across the oceans was demonstrated throughout the year. Various important public affairs events of world-wide interest were relayed via INTELSAT satellites.

Among the major events relayed via communication satellites during 1969 were: the inauguration of President Nixon, the funeral of General Eisenhower, the DeGaulle referendum in France and the French national elections, President Nixon's meeting with President Thieu, President Nixon's visits to Western Europe, Romania and the Far East, the Investiture of the Prince of Wales, the Pope's visit to Uganda, the Wimbledon tennis tournament, the U.S. baseball World Series, and the Strategic Arms Limitation Talks (SALT) in Helsinki, Finland.

Of special interest were the live television broadcasts of the APOLLO 9, 10, 11 and 12 missions. The historic APOLLO 11 moonlanding showing man's first steps on the surface of the Moon, was one of the most dramatic and significant scientific accomplishments in history. The moonlanding was relayed by communication satellite to five continents, which also made it the most widely shared event in history.

V

SUMMARY

Opportunities and challenges

The first operational commercial communications satellite (Early Bird) was deployed to meet expanding telecommunication requirements in the high traffic volume North Atlantic region. Subsequent operational satellites (INTELSAT II's and III's) are providing satellite capability in the Atlantic, Pacific and Indian Ocean regions to those nations with earth stations, thereby assuring them efficient, economical, direct access to the Global System. There is an opportunity to promote the development of technology which will accommodate low-density traffic sources throughout the world. Here the challenge is to promote the early utilization of advancing technology which will bring the benefits of direct access to the Global within the economic means of any nation desiring such access.

The initial use of the Global System has been to provide international public telecommunication services. There is an opportunity for technical and management innovations to take advantage of the unique attributes offered by advancing technology in expanding the

range of telecommunication services by making broader applications of communication satellites. Here the challenge is to address the complex technical, social, political and economic problems and formulate meaningful United States national and international policy.

Finally, many opportunities are presented to the nation in bringing the benefits of satellite communications to mankind. In meeting this challenge, the United States will continue to support the Global Commercial Communications Satellites System which is made available to all nations—large and small, developed and developing—on a non-discriminatory basis by the International Telecommunications Satellite Consortium (INTELSAT).

APPENDIX A

[illegible]

APPENDIX C

INTELSAT SATELLITES—GROWTH IN OPERATIONAL CAPABILITY

Item	Intelsat I (Early Bird)	Intelsat II	Intelsat III	Intelsat IV ¹
Diameter (inches).....	28.4	56	56	93
Height overall (inches).....	47.1	51	78	193
Weight in orbit (pounds).....	85	190	322	1,584
Design lifetime (years).....	1½	3	5	7
Total 2-way telephone circuits ²	240	240	1,200	3,000-8,000
TV channels ³	1	1	4	12

¹ Parameters estimated.² When used with standard earth stations having 85- to 97-ft. diameter.³ Depending on type modulation, number of carriers per repeater, and antenna beam width used.⁴ In lieu of telephone circuits.



May 28, 1970

EVA:

When Mr. Whitehead has
read the attached, would
you please destroy it.

Jackie

ATC.

Comsat

MEMORANDUM TO JOHN L. MARTIN, JR.

May 27, 1970

FROM: Robert E. Button

The Office of Telecommunications Policy has requested a briefing on the national policy implications of the COMSAT Aeronautical Satellite Proposal. The agreed time and place will be at 1430, June 5th, in Room 742 at 1800 G Street, N.W.

In attendance will be personnel from OTP, the Space Council, Office of Science and Technology, and the Bureau of the Budget.

The Office of Telecommunications Policy requests that the briefing be responsive to the following questions:

- 1) The compatibility of the COMSAT aeronautical satellite approach with the pending NASA/ESRO North Atlantic project.
- 2) The role, if any, of INTELSAT in the proposal.
- 3) Acceptability of the proposal to ICAO members and its relation to the U.S. position at future ASTRA-panel meetings.
- 4) Feasibility of obtaining U.S. Government support of the "hybrid" approach.
- 5) The impact of the COMSAT proposal on the U.S. position to be taken at the 1971 WARC meeting.

OTP is not publicizing the meeting beyond those specifically invited and suggests that the presentation be held in a low key.

R.E.B.

cc: Dr. Charyk
Vice Presidents

MEMORANDUM TO NICHOLAS ZAPPLE

May 22, 1970

FROM: Robert E. Button

As you well know, we are trying to find the right way to get into the domestic satellite business. Our possible customers seem to be limited to AT&T, the broadcasters, CATV, and data. Of the various assumptions we have made, the most significant are:

- A. That AT&T would take full capacity of two 24-transponder satellites;
- B. That a third satellite, after the above, would be available for direct access by any customer we might find;
- C. That we may not have the cooperation of AT&T in (A) and therefore may have to go it alone.

In seeking a viable system customer (other than AT&T) we have been having discussions with the broadcasters on one hand and CATV on the other. The common denominator between these two, who are otherwise at loggerheads, is simply the desire for inexpensive inter-connection.

The possibilities in the CATV field seem to point to the emergence of a nationwide broadband cable service inter-connected by satellite, thus creating something that does not now exist. What also does not exist is a network organization or structure in a business sense capable of purchasing or even creating a domestic satellite system. Irving Kahn is the furthest ahead with the planning but there are several people in the industry who might not want Teleprompter to own the whole thing in five years.

An analysis of the situation leads us to the idea of calling in a dozen or so of the CATV leaders (including Kahn) and showing them the satellite potential as the basis of forming a network organization, complete with affiliates, sales and technical divisions. If we were persuasive with our economics, we would hope that the industry reaction would be to immediately settle down to organize a joint venture of some kind (in which we might be willing to participate as part owner).

Since the technology at hand is quite capable of putting up a satellite with more capacity than CATV would immediately need, it is just possible that we could get the two sides of the broadcasting house together to talk about this mode of transmission as being to their mutual advantage. Who knows but that they might go on to other topics if they could get together on this?

We are doing some very hard work on the economics of such a system and some preliminary checking shows that the CATV crowd is quite willing to listen. So is the Commission.

Sometime before the NCTA Annual Convention in Chicago (June 7-10), I would appreciate an opportunity to explore this project a little further with you.

R.E.B.



COMMUNICATIONS SATELLITE CORPORATION

Comsat

LUCIUS D. BATTLE
Vice President for
Corporate Relations

May 19, 1970

Dr. Clay T. Whitehead
The White House
Washington, D.C. 20500

Dear Tom:

At the recent annual meeting of Comsat stockholders, the President of Comsat, Dr. Joseph V. Charyk, announced a proposal to provide aeronautical communications services between aircraft and ground controller facilities for the Federal Aviation Administration (FAA) and Aeronautical Radio, Incorporated (ARINC). This service will make possible for the first time reliable direct voice communications between pilots and ground controllers on transoceanic flights and needed improvements in transoceanic air traffic control and airline operational communications. These improvements will include pre-operational introduction of new procedures, such as direct pilot-to-controller voice transmission in oceanic control areas and the use of data link. Communications channels also are proposed which will provide to the FAA and the National Aeronautics and Space Administration (NASA) an early and cost-effective means of accomplishing important experimental aeronautical services work.

Comsat proposes to provide these services by means of satellites, ground equipment and associated facilities which are funded, established and operated by Comsat, on a firm-contract basis involving no satellite system investment by the users, under terms whereby no user funds are paid to Comsat until the services are available, and thereafter are paid on the basis of fixed monthly charges.

Dr. Clay T. Whitehead

-2-

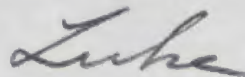
May 19, 1970

These services are proposed in response to the needs reflected in the United States National Plan for Aeronautical Telecommunications Services via Satellites, the Proposed Program for Aeronautical Satellite Development of the FAA, and the papers and reports of various national and international groups within the aviation community.

Because of your interest in these matters, I attach a copy of the proposal. In the event you would like to have more detail, please get in touch with me.

Best regards.

Sincerely,



Lucius D. Battle

Attachment

Proposal to
Provide

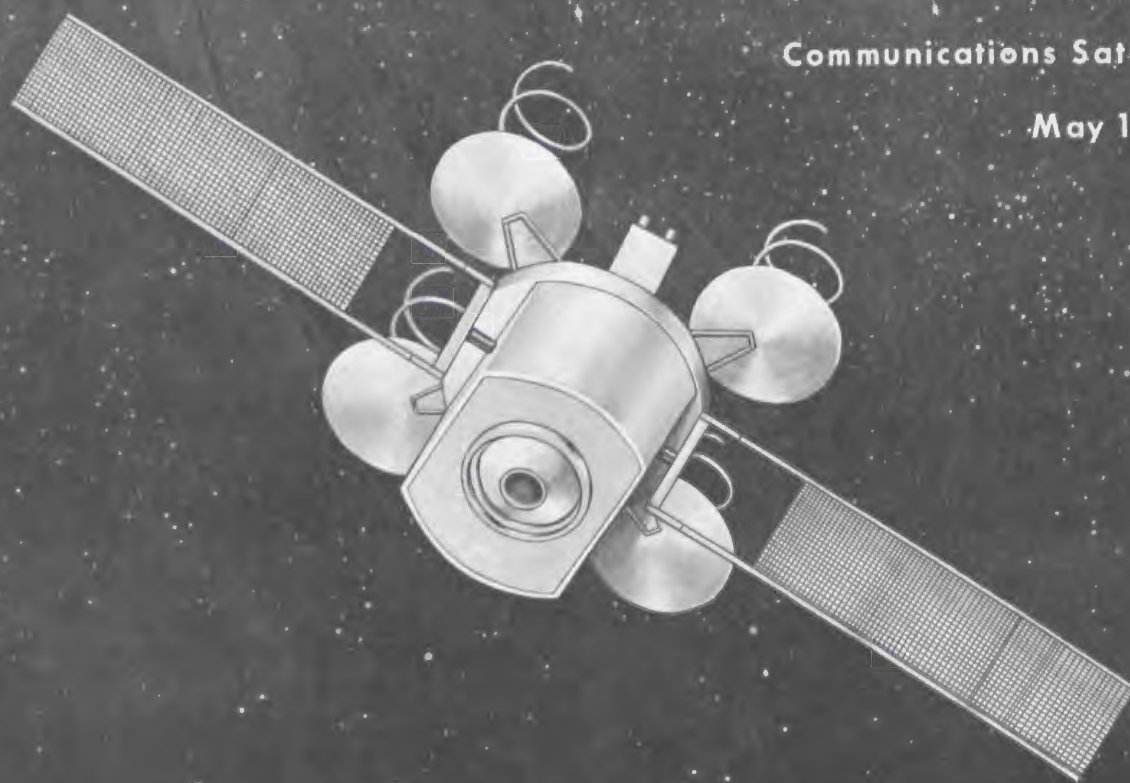
**AERONAUTICAL
COMMUNICATIONS
SERVICES**



Proposed By

Communications Satellite Corporation

May 1970



Proposal
to Provide

AERONAUTICAL COMMUNICATIONS
SERVICES

Proposed by

Communications Satellite Corporation
May 1970

Table of Contents

	<u>Page</u>
<u>ABSTRACT</u>	i
<u>BACKGROUND</u>	ii
 <u>PART I - PROPOSAL</u>	
Introduction	I-1
System Design Considerations	I-3
Operational Concept	I-6
Service Offering	I-8
Costing Factors	I-10
Service Charges	I-13
User Commitments	I-14
Conditions of Proposal	I-15
Alternatives	I-16
Advantages	I-17
Applicability to Government Use	I-19
 <u>PART II - MANAGEMENT</u>	
General	II-1
Satellite System Design	II-1
Equipment Fabrication	II-1
Satellite System Operation	II-3
Comsat Laboratories	II-3
Computer Facilities	II-6
Program Management	II-6
 <u>PART III - TECHNICAL DESCRIPTION</u>	
Introduction	III-1
Deployment Plans	III-3
Space System Characteristics	III-9
Ground Facilities	III-23
Aircraft Equipment	III-31
VHF Operations	III-39
Test Programs	III-47
Long Range Program Plan	III-57

ABSTRACT

This is a Communications Satellite Corporation (Comsat) proposal to supply air/ground satellite-relayed communications channels to the Federal Aviation Administration (FAA) and Aeronautical Radio, Incorporated (ARINC). These channels will make possible early improvements in transoceanic air traffic control and airline operational communications. These improvements will include pre-operational introduction of new procedures, such as direct pilot-to-controller voice transmission in oceanic control areas and the use of data link. Communications channels also are proposed which will provide to the FAA and the National Aeronautics and Space Administration (NASA) an early and cost-effective means of accomplishing important experimental aeronautical services work.

Comsat proposes to provide these services by means of satellites, ground equipment and associated facilities which are funded, established and operated by Comsat, on a firm-contract basis involving no satellite system investment by the users, under terms whereby no user funds are paid to Comsat until the services are available, and thereafter are paid on the basis of fixed monthly charges.

BACKGROUND

On 16 January 1969, Comsat submitted a proposal to Aeronautical Radio, Incorporated (ARINC) for VHF (118-136 MHz) aeronautical communications services provided via satellite-relay in the major oceanic areas. These services were to be shared by the airlines and the FAA for air traffic and operational control, through joint ARINC/FAA procedures. They were proposed in response to needs stated by the airlines and the FAA for early improvement in transoceanic communications to meet existing problems. Although discussions of this proposal continued throughout the year, essential agreement to proceed was not reached.

On 1 December 1969, the FAA Administrator advised ARINC that the overall acceptability of the proposal could be enhanced by considering a dual frequency ("hybrid") satellite which could provide communications services in both the VHF and UHF (1540-1660 MHz) bands. As a result of the Administrator's letter, ARINC asked Comsat for a new proposal based upon a dual-frequency satellite.

The FAA Administrator also noted the possibility that economies would result from an effort which could share the total payload capability of the launch vehicle between services in the two frequency bands. FAA officials have also suggested to ARINC and the airlines the possibility that NASA might join in a cooperative effort with FAA, supporting a share of the program on the basis of NASA interest in the development of UHF technology for aeronautical services.

Accordingly, Comsat herewith proposes to provide aeronautical communications services in both the VHF and UHF bands, via satellites with simultaneous relay capability in both bands.

PART I

PROPOSAL

Introduction

Comsat proposes to provide aeronautical mobile communications services for use by ARINC, FAA and NASA, including voice and data communications channels between terrestrial facilities and aircraft in flight over the Pacific and Atlantic Ocean areas. Services are provided in the two frequency bands of current aeronautical interest: the VHF band (118-136 MHz) and the UHF band (1540-1660 MHz - also referred to as L-Band).

This Proposal includes VHF communications services for airline use in enroute transoceanic operational communications and VHF services for use by the FAA to provide improvement in enroute air traffic control communications for these areas. These services are proposed in response to existing airline and air traffic control needs.

The proposal also includes UHF communications services for use by the FAA and NASA in the conduct of experimentation and pre-operational evaluation of the comparative utility of aeronautical communications in the UHF and VHF bands. The availability of these communications services will permit the FAA and NASA to test, at an early date a variety of techniques and procedures to provide continuously available surveillance of aircraft in oceanic regions. Such surveillance would make possible important future improvements in the safety and efficiency of oceanic traffic control in regions beyond the line-of-sight of shore-based radar.

These services are proposed in response to the needs for such experimental and pre-operational comparative evaluation, reflected in the United States National Plan for Aeronautical Telecommunications Services via Satellites, the Proposed Program for Aeronautical Satellite Development of the FAA, and the papers and reports of various national and international groups within the aviation community. They are proposed in recognition that accomplishment of such experimentation and evaluation is a prerequisite to attainment of essential agreement on the desired characteristics of fully operational international aeronautical communications services to be provided via satellites.

These proposed communications services can be provided in both the VHF and UHF bands, without awaiting further government research and development work on satellites, satellite equipment, or satellite systems. Consequently, Comsat proposes to provide these services on a commercial, fixed-price basis, by means of

satellites, earth stations, and associated equipment completely funded, established and operated by Comsat. No payments to Comsat will be required from users until the services are available. Comsat will initiate necessary action to provide system hardware on a competitive, fixed-price basis immediately upon obtaining user commitments to purchase the proposed communications services when available. Upon reaching agreement with selected equipment manufacturers, Comsat will execute a firm fixed-price contract with the users, under which Comsat will undertake to furnish the proposed services, and the users will be committed to purchase these services when they become available. User payments will begin when the services become available, and extend over the five-year period of the service.

System Design Considerations

Some significant considerations in the design of the dual-frequency system by which the proposed services will be provided are summarized below:

1. The launch vehicle will be a 1972 version of the Thor-Delta which will almost double the Delta's present synchronous transfer orbit payload capability. This will permit an increase in power, weight and space sufficient to combine VHF and UHF capability in the same satellite, meeting the requirements of the proposed services.

2. The overall limits on system design are set by the above vehicle maximum capability. The allocation of VHF capacity is based on providing the minimum communications services to meet existing needs of the airlines and FAA for improvement of air/ground communications. The remaining spacecraft capacity is allocated to provision of UHF communications services. The largest number of VHF channels required in either area is taken to be three voice channels for the Pacific region. This, then, determines the minimum UHF capacity. The maximum UHF capacity is available in the Atlantic region, where the VHF requirement is taken to be two voice channels. Sufficient satellite power will be available to provide the VHF and UHF services simultaneously in each case.

3. The resulting hybrid system has the capability of providing various combinations of VHF and UHF services, as is further detailed in Part III of this Proposal. The quantity of UHF services that can be derived from a fixed allocation of satellite capacity to UHF will be strongly dependent upon the performance of UHF aircraft equipment. Since this aircraft equipment is still in the development stage, its performance is not yet determined. In order to

quantify such services, two levels of aircraft UHF receive station performance are assumed in this proposal: "nominal" performance ($G/T = -26 \text{ dB/}^{\circ}\text{K}$) and "high" performance ($G/T = -20 \text{ dB/}^{\circ}\text{K}$). These performance levels would be met by aircraft stations with a noise temperature of 800°K and minimum receive antenna gains of 3 dB and 9 dB, respectively. As a typical example, allocation of satellite capacity to two (2) VHF voice channels would leave a residual UHF capacity of one (1) UHF voice and one (1) UHF data channel with "nominal" performance UHF aircraft stations, or four (4) UHF voice and four (4) UHF data channels with "high" performance UHF aircraft stations. The resulting capacity of the proposed two-ocean program appears adequate to meet the present needs for improved communications for the airlines and for air traffic control in both ocean areas, while at the same time providing adequate two-ocean capacity at both VHF and UHF to obtain required technical data needed to define the characteristics of follow-on service.

4. While the basic unit of the proposed service is a specifically defined communications capacity (in terms of channels), the system is designed to permit maximum flexibility in the conversion from one desired service configuration to another. Major reconfiguration options are outlined later in this proposal. Since the VHF services are proposed for specific airline and air traffic control use for the entire five-year service period, this flexibility is significant in the VHF case primarily in the option it affords to convert some VHF voice capacity to data capacity. In the UHF case, the flexibility provides a wide range of options. It is anticipated that the communications channels provided by the UHF portion of the system would be used, at least initially, for the conduct of tests evaluating various communications and surveillance techniques,

as well as the achievable performance of operationally practical aircraft equipment. At the conclusion of the initial test period, the UHF service could be either continued, or converted to operational use if practical aircraft equipment has become available and this (and/or other) experimental work has shown such conversion to be a desirable course of action. It also could be discontinued, with the satellite power thus converted to increased VHF communications capacity if desired.

Operational Concept

The system through which the proposed services will be provided consists of a synchronous satellite located over the Pacific and one over the Atlantic Ocean areas (a one-ocean option is available also), together with the necessary earth stations and associated equipment. The system configuration is described and geographic coverage is illustrated in Part III of this Proposal. Operationally, the communications channels may be terminated in existing switching facilities located at aeronautical communications stations. This will permit access to channels by communications station personnel for the initiation and receipt or switching of voice and data communications with aircraft in flight. Extension of this service to established air traffic control centers or airline management centers, or other user locations, may be accomplished by routine manual switching into the existing terrestrial network. This will allow direct pilot-to-controller and aircraft-to-management-center voice communication.

The proposed operational concept for two-ocean service (Option #1) includes an initial period of two-satellite service in the Pacific area. This would be accomplished by launching the Atlantic satellite about three months after launch of the Pacific satellite, but stationing it initially in the eastern edge of the Pacific area. This would provide a useful area of overlapping earth coverage, and would permit accomplishment of important tests requiring such overlapping coverage from two satellites (explained further in Part III). At the end of this initial testing period, suggested as approximately one year, the Atlantic satellite would be moved to its Atlantic station.

The system has been designed with a high degree of flexibility which will permit the users to conduct experiments in the use of these communications channels in both the VHF and UHF frequency bands, separately or simultaneously.

Telemetry and command functions essential to satellite monitoring and control will be provided from existing U.S. earth station locations.

This proposal provides for service under Option #1 via two (2) VHF earth stations in the Pacific area and one (1) in the

Atlantic area, which will be located at existing U.S. earth station sites, or other facilities available to Comsat, and one (1) UHF station to serve each area. Option #2 includes two (2) VHF stations and one (1) UHF station.

The terrestrial extension of these communications channels from the earth stations to ARINC communications stations, FAA control centers, or other user locations, is not part of this offering.

Service Offering

Comsat offers to provide the aeronautical communications services, as stated under Option #1 or Option #2 below, by means of satellites and earth stations established and operated by Comsat, for use in the Pacific and Atlantic Ocean areas, as described in this Proposal. Two contracts are proposed to provide these services: one with ARINC, and one with FAA. Services offered under the contract with ARINC are for use by ARINC and FAA to meet existing airline and air traffic control VHF communications needs. Services offered under the contract with FAA are for use by FAA and NASA in UHF pre-operational evaluation and experimentation.

This offering is based on the service as stated below; however, Comsat will reconfigure its equipment to provide optional service configurations inherent in each option, as desired, at the user's request. A more complete explanation of the optional service configurations is provided in Part III of this Proposal.

All services can be provided simultaneously in the configurations listed below (i.e., the VHF service, plus the "nominal" or "high" performance UHF service listed under each option).

OPTION #1 - Two-ocean service (one satellite each area):

PACIFIC AREA

VHF Service to ARINC:

3 Voice Channels

UHF Service to FAA (narrow (8°) beam coverage):

<u>Participating Aircraft Stations:</u>	<u>"Nominal" Performance</u>	<u>"High" Performance</u>
Voice channels	1	3
1200 BPS data channels	0	3
Ranging channels	1	1

ATLANTIC AREA

(Initially stationed so as to provide for two-satellite service in the eastern Pacific, then moved to the Atlantic one year later.)

VHF Service to ARINC:

2 voice channels

UHF Service to FAA (narrow (8°) beam coverage):

<u>Participating Aircraft Stations:</u>	<u>"Nominal" Performance</u>	<u>"High" Performance</u>
Voice channels	1	4
1200 BPS data channels	1	4
Ranging channels	1	1

OPTION #2 - One-ocean service (one satellite):

PACIFIC AREA

Service under this option is the same as outlined for the Pacific area under Option #1.

Costing Factors

The service charges for the two service configurations offered in this proposal are based on the costs of providing and operating the satellites and associated command and telemetry equipment, known as the space segment, and providing and operating the associated Comsat-supplied earth stations.

For the purposes of estimating space segment costs, the following assumptions have been made:

1. The space segment will be provided by Comsat.
 - a) One Ocean (one satellite in orbit):
Purchase two spacecraft, cost flight of both, on assumption of one launch or satellite failure.
 - b) Two Ocean (one satellite in orbit for each area):
Purchase three spacecraft, cost flight of three, on assumption of one launch or satellite failure.
2. The satellites will be launched for Comsat by NASA, using a 1972 version of the Thor-Delta launch vehicle.
3. Comsat will bear the risk of failure of these launch vehicles and satellites.
4. The satellites will have a five-year lifetime.
5. Telemetry and command functions will be carried out through existing facilities.

The satellite costs have been estimated on the basis of analysis of previous industry proposal responses, the technical configuration of the spacecraft, and Comsat's knowledge of the satellite communications business. Satellite launch costs are based on estimates for the improved Thor-Delta launches in the 1972-73 time frame.

For the purposes of estimating the ground segment costs, the following assumptions have been made:

1. Major aeronautical satellite VHF terminals will be co-located with existing Comsat earth stations or other facilities available to Comsat.

- a) The Pacific Ocean area will be served by VHF terminals co-located with the Jamesburg, California, or Brewster, Washington, and Paumalu, Hawaii earth stations (under either option).
- b) The Atlantic Ocean area will be served by a VHF terminal co-located with the Etam, West Virginia, or Andover, Maine earth stations (under Option #1 only).

2. UHF earth stations will be transportable-type terminals and will be stationed in a position to meet the UHF experimental requirements. Two UHF stations will be provided under Option #1 (two-ocean service), and one station under Option #2 (one-ocean service).

3. This offer does not include the provision of airborne communications stations, nor the costs associated with terrestrial extension from the Comsat earth stations to customer facilities.

The VHF and UHF equipment is integrated into a common spacecraft and shares a common power supply, command, telemetry system, and other satellite elements. Allocation of costs between the VHF and UHF services is based upon an assessment of the relative cost contribution of each in the hybrid configuration, and the relative impact on the operating capacity of the resulting satellites in the proposed operating configuration.

Because the proposed services can be sold only to a very specialized market, the proposed services are offered

under each contract on a "package deal" basis -- a fixed-price commitment to pay a specified charge over a specified service period, regardless of the actual degree of usage the customer makes of the communications capacity made available.

Service Charges

The annual and five-year totals shown below are the required charges for the communications services described. No funds for these services are required from users until the services are available for use. Thereafter, throughout the service period, the listed monthly contract charges will apply. Any sharing arrangements between the users under each contract would be acceptable, provided that the listed totals of contract charges are met.

TWO-OCEAN SERVICE

(\$ millions)

Total Contract Charges

<u>Service</u>	<u>Contract with</u>	<u>Monthly</u>	<u>Annual</u>	<u>5-Year</u>
VHF	ARINC	.61	7.3	36.5
UHF	FAA	.97	<u>11.7</u>	<u>58.5</u>
			<u>19.0</u>	<u>95.0</u>

ONE-OCEAN SERVICE

(\$ millions)

Total Contract Charges

<u>Service</u>	<u>Contract with</u>	<u>Monthly</u>	<u>Annual</u>	<u>5-year</u>
VHF	ARINC	.56	6.7	33.5
UHF	FAA	.65	<u>7.8</u>	<u>39.0</u>
			<u>14.5</u>	<u>72.5</u>

User Commitments

Initiation of necessary action to establish these services is contingent upon a five-year commitment by the FAA and ARINC to purchase these services when available. Upon receipt of such commitment, Comsat will promptly initiate competitive procurement for necessary spacecraft and associated equipment.

This commitment will be superseded by a firm, fixed-price, 5-year contract between the users and Comsat after Comsat has negotiated the required contracts with industry, but prior to giving the contractors a notice to proceed. These user-Comsat contracts will commit Comsat to undertake the furnishing of the services, and will commit the users to pay the specified charges, on a fixed-price monthly basis, independent of the degree to which the specified services may be used throughout the service period. Appropriate termination provisions will be included in these contracts.

It is anticipated that the service could commence in approximately 21-24 months from the date of definitive Comsat contract(s) with the selected equipment contractor(s).

Conditions of Proposal

This Proposal is contingent upon Comsat's obtaining satisfactory contracts with equipment suppliers for the necessary equipment to provide the services offered, at prices which are within the Comsat estimates upon which the proposed charges were determined.

The Proposal is also contingent upon Comsat's obtaining the necessary approval of the Federal Communications Commission.

Alternatives

The plan for providing communications services outlined in this Proposal is based upon Comsat's present understanding of the immediate needs of the air carriers and the FAA, and the needs of the aviation community for experimentally determined technical and operational information upon which to determine the required characteristics of communications service to be provided by a second generation aeronautical satellite system. Within the constraints of available technology, this plan can be modified to meet different user requirements, if desired.

Comsat is willing to explore other possibilities, and to provide any required aeronautical communications services in either the VHF or the UHF frequency bands, or both, under the same type of arrangements as outlined in this Proposal.

Advantages

This Comsat Proposal has the following significant features of advantage to the proposed users.

1. It meets the existing needs for improved communications for airline company operations and for FAA air traffic control at the earliest date. It does not postpone meeting the problems of today as a consequence of working on the problems of tomorrow.

2. It provides the earliest technically adequate capability for simultaneous comparative evaluation of various techniques to determine the relative characteristics of follow-on, second generation aeronautical communications services.

3. It requires no government development of satellites or satellite equipment and no investment of government funds in satellites or satellite equipment. The satellite system, including provisions for flight of one spare spacecraft, will be funded by Comsat. Comsat will bear the risks of failure of these launch vehicles and satellites.

4. No user payments to Comsat are required for these communications services until the services are available, and thereafter, only at fixed monthly charges.

5. The proposed services support vital objectives of the United States National Plan for Aeronautical Telecommunications Services via Satellites, the Proposed Program for Aeronautical Satellite Development of the FAA, and stated research and development objectives of NASA. There is minimal risk of substantial slippage to these plans and objectives due to launch or spacecraft failures, since Comsat will include provision of reasonable spares in its initial purchase of equipment.

6. The communications channels in both the VHF and the UHF bands can be used in a variety of service configurations at the selection of the users.

7. Since the users will have a contract for provision of communications services, rather than for acquiring satellites by means of which these services are provided, all of the available user management and user development funds can be applied to the task of how the communications channels will be used instead of how they are to be obtained.

Applicability to Government Use

Recently published documents and recent discussions reflect that both the FAA and NASA are considering development of government-funded satellite systems to be used in experimental and pre-operational application of satellite-relayed communications to the aeronautical field. With respect to the question of satellite system deployment, Comsat believes that it can provide the communications channels outlined in this Proposal on a commercial basis without requiring any government investment in, or research and development effort on, satellite vehicles, satellite-borne equipment, or satellite system earth station components. The seriousness of this belief is illustrated by Comsat's offer to completely fund the system by which it will provide these services, under fixed-price terms which require no payments to Comsat by the users until the services are available.

Comsat also believes that its proposal is in accord with established national policy which provides that the government shall use commercial communications facilities whenever adequate and efficient facilities and services may be furnished economically, and shall establish separate communications satellite systems only when required to meet unique and vital national security needs which cannot be met by the commercial system. The relevant feature of a commercial satellite would be the provision of satellite-relay communications channels in the desired bands on a fixed-charge basis without requiring any investment of government funds in satellites or earth stations. These channels can be used in the same way as could similar channels provided by a government satellite. The functional use of these channels is irrelevant, since the functional use is at the discretion of the users.

The use of these commercially available UHF services by the FAA and NASA will permit the concentration of FAA and NASA research and development effort on the advancement of aircraft equipment and ground air traffic control equipment, which do require extensive development, and which are the pacing items in the application of UHF technology on a practical operational basis. This will result in the earliest determination of a sound basis upon which follow-on aeronautical service can be configured, on a fully operational, international basis. It will also allow NASA satellite research and development program effort to concentrate

on investigations of more advanced UHF technology for possible applications further into the future. At the same time, the use of the proposed VHF services by ARINC and FAA will permit early relief of existing airline and air traffic control communications problems, through the use of presently available technology.

PART II

MANAGEMENT

General

As the world's most experienced organization in the business of commercial satellite communications, Comsat is uniquely qualified to provide reliable and effective aeronautical satellite communications services. To accomplish this task, Comsat will draw upon its extensive resources and over five years of successful operation of a complex global system of communications satellites. A professional staff with a wide range of skills and disciplines will be applied to the establishment of an effective aeronautical satellite communications system and the technical operation and management of the system upon its service inauguration. The organization of the company (outlined in Figure II-1) has been designed to meet the widely varied needs involved in establishing and managing a global satellite communications system, and many of the same skills and expertise developed for that objective are directly applicable to the task of providing an aeronautical satellite communications service.

Satellite System Design

Comsat intends to contract for the development of the detailed design of equipment for the aeronautical satellite system, based upon the systems analysis and performance requirements developed by Comsat's Technical Staff. Design considerations concerning the practical aspects of the day-to-day operation of a satellite communications system will be based on the actual experience of the Comsat Operations Staff.

Equipment Fabrication

Comsat will contract for the development and fabrication of satellite and earth station equipment to provide the proposed communications services. Throughout the design and fabrication of the satellite system, Comsat will station a technical project staff of various professional skills at the major contractor's plant. This project staff will monitor the work of the contractor at his facilities on a day-to-day basis from design through fabrication, test and acceptance of the equipment. These personnel will be selected on the basis of expertise in systems engineering, spacecraft structures, positioning and orientation systems, spacecraft communications packages, satellite power subsystems,

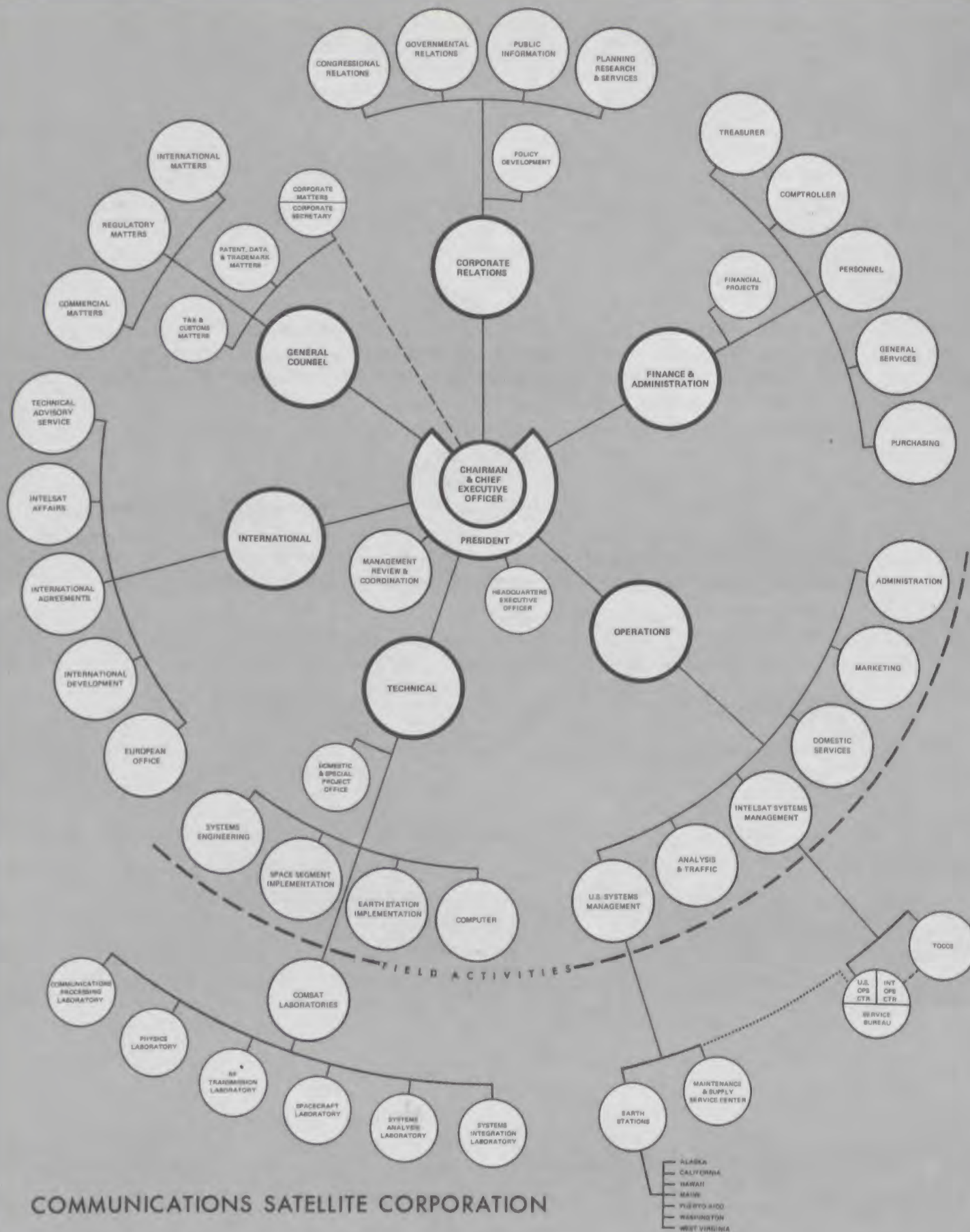


Figure II-1

tracking telemetry and command (TT&C) subsystems, and the most current reliability and quality assurance techniques. It has been our experience that this on-the-spot skilled monitoring has been very effective in assuring a reliable and efficient spacecraft.

Satellite System Operation

Throughout its years of successful and reliable operation of a complex global satellite communications system, Comsat has managed the operation of the satellites through tracking, telemetry and command (TT&C) earth stations. Comsat provides the complete staffs for the TT&C stations at Andover, Maine and Paumalu, Hawaii (the Paumalu station is illustrated in Figure II-2). Day-to-day satellite communications services to the United States common carriers are provided through large earth stations at Andover, Maine; Brewster, Washington; Paumalu, Hawaii; Jamesburg, California; Etam, West Virginia; and Cayey, Puerto Rico, which are jointly owned by Comsat and the various U.S. common carriers. These stations are manned and operated by Comsat personnel. Performance monitoring of these stations and the control of communications traffic redistribution through them is accomplished by the Comsat Operations Control Center at the Corporate Headquarters in L'Enfant Plaza, Washington, D. C. The satellites used in the global network are monitored and controlled by Comsat personnel from the Comsat-operated Spacecraft Technical Control Center also located at L'Enfant Plaza. The reliability and continuity of satellite communications employed to date, therefore, attests not only to the technical quality of the satellite and terrestrial facilities design, but also to the skills of these expert operations and maintenance staffs. These resources, skills and this extensive and successful operational experience will form the basis of Comsat's management and operation of the proposed aeronautical satellite communications system.

Comsat Laboratories

The extensive research laboratories of Comsat, which are located in Clarksburg, Maryland, are primarily responsible for the research and development efforts of the Corporation (see Figure II-3). The Laboratories complex consists of six individual laboratories which constitute specialized technical and scientific



Figure II-2 An aerial view of the Paumalu, Hawaii earth station for commercial satellite communications showing the new 97-foot diameter antenna at right.



Figure II-3 Comsat Laboratories - Clarksburg, Maryland

strength in the fields of:

- (a) Systems Analysis
- (b) Communications Processing
- (c) Systems Integration
- (d) RF Transmission
- (e) Spacecraft
- (f) Physics

The skills and facilities of these Comsat Laboratories will be used to support the establishment of the proposed aeronautical satellite system. The engineers and scientists of the Comsat Laboratories will be available for continuing consultations in support of the aeronautical satellite system program, and will provide technical support including testing of critical spacecraft components and subsystems.

Computer Facilities

An additional Comsat resource which will provide support to the aeronautical satellite program is an IBM 360/65 computer facility with considerable peripheral equipment located in the Laboratories at Clarksburg, Maryland, which supports the work of the Laboratories and also the Technical and Operations Staffs at L'Enfant Plaza. This facility is used extensively in all phases of satellite system analysis in addition to providing support during launch and positioning of the satellites, and to the operation of the global network.

Program Management

In conjunction with the proposed aeronautical communications satellite service, Comsat will appoint an overall Program Manager, who will be directly responsible to the President of the Corporation.

PART III

TECHNICAL DESCRIPTION

III.1 INTRODUCTION

The system described in this Proposal is configured to provide VHF and UHF aeronautical communications satellite services simultaneously. As a result, it makes possible the early exploitation of VHF satellite technology for improvement in transoceanic air/ground communications, as well as the earliest feasible development of UHF technology for potential operational application in follow-on systems.

The VHF communications portion of the system is designed to provide channels which can be used for two-way simplex voice or data communications. The UHF portion of this system is designed to provide the opportunity for test and demonstration of various techniques for voice, data communications and position determination for surveillance. The combination of these services in a common satellite is made possible by planned increases in the payload capability of the Delta launch vehicle.

Section III.2 describes a deployment plan for two hybrid satellites (satellites with both VHF and UHF functions). This plan appears to satisfy simultaneously the previously expressed needs of the airlines and FAA to improve communications in the Pacific while testing advanced communications techniques for a second generation system at minimum overall cost.

Section III.3 describes the characteristics of the proposed space system which would include hybrid satellites designed for launch on the Delta vehicle. The particular design configuration discussed could be modified to meet requirements of the users other than those assumed in the proposed service offering.

Sections III.4 and III.5 describe the necessary ground facilities and assumed aircraft equipment characteristics, respectively.

Section III.6 summarizes the characteristics of the VHF communications system, along with a typical VHF frequency plan that might be employed in the Pacific region.

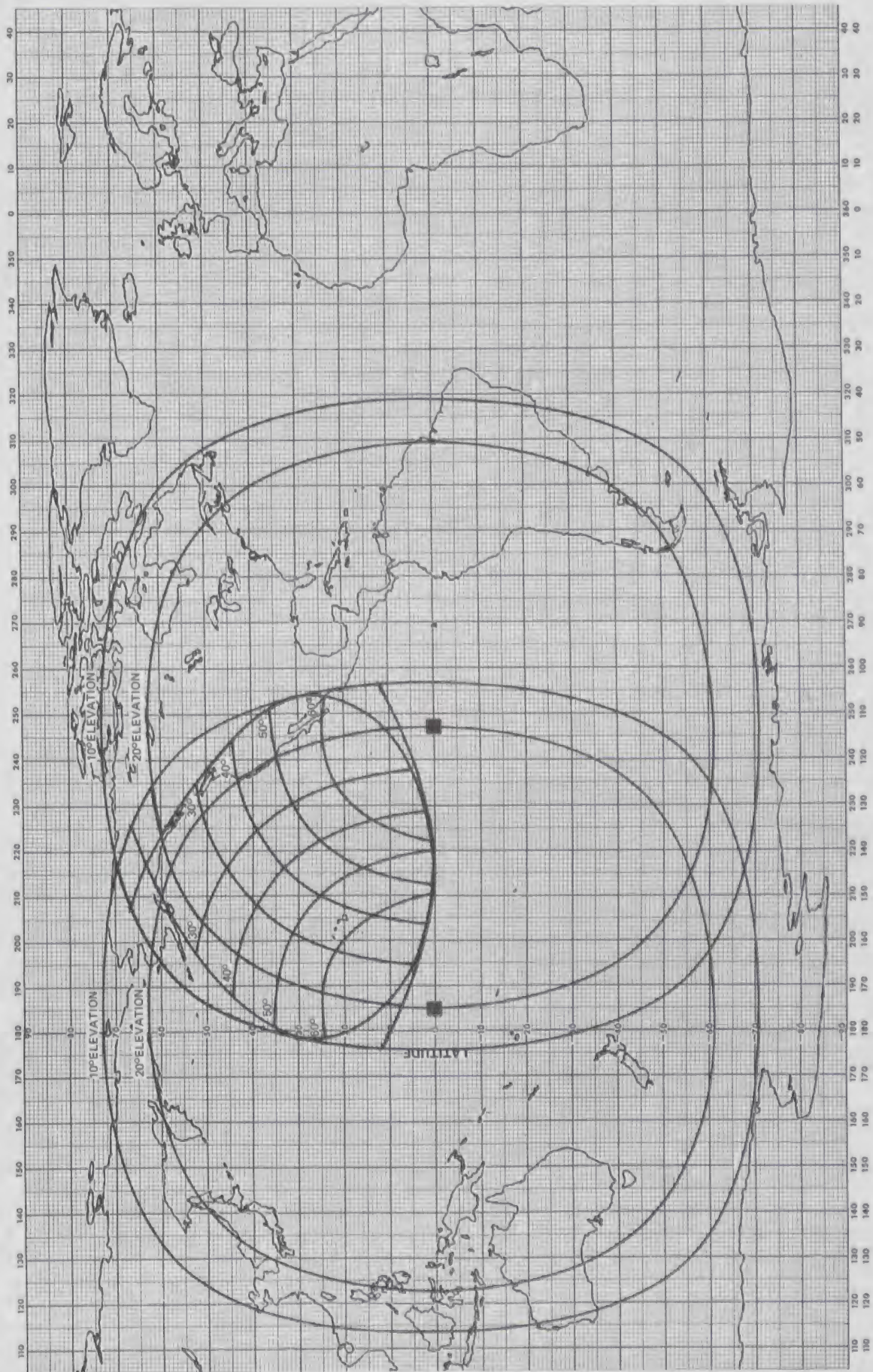
Having taken note of the various test and evaluation objectives of aeronautical satellite service users, Comsat has

outlined in Section III.7 a set of test programs which could be accomplished using the services offered.

Finally, Section III.8 briefly outlines a long range program plan showing the relationship between necessary research and development programs and experimental and operational evaluation programs that could be achieved using this system. Implementation of this plan would lead to a fully operational system for the Atlantic and Pacific regions by late 1970's.

III.2

DEPLOYMENT PLANS



INITIAL DEPLOYMENT OF TWO SATELLITE SYSTEM

G-6872

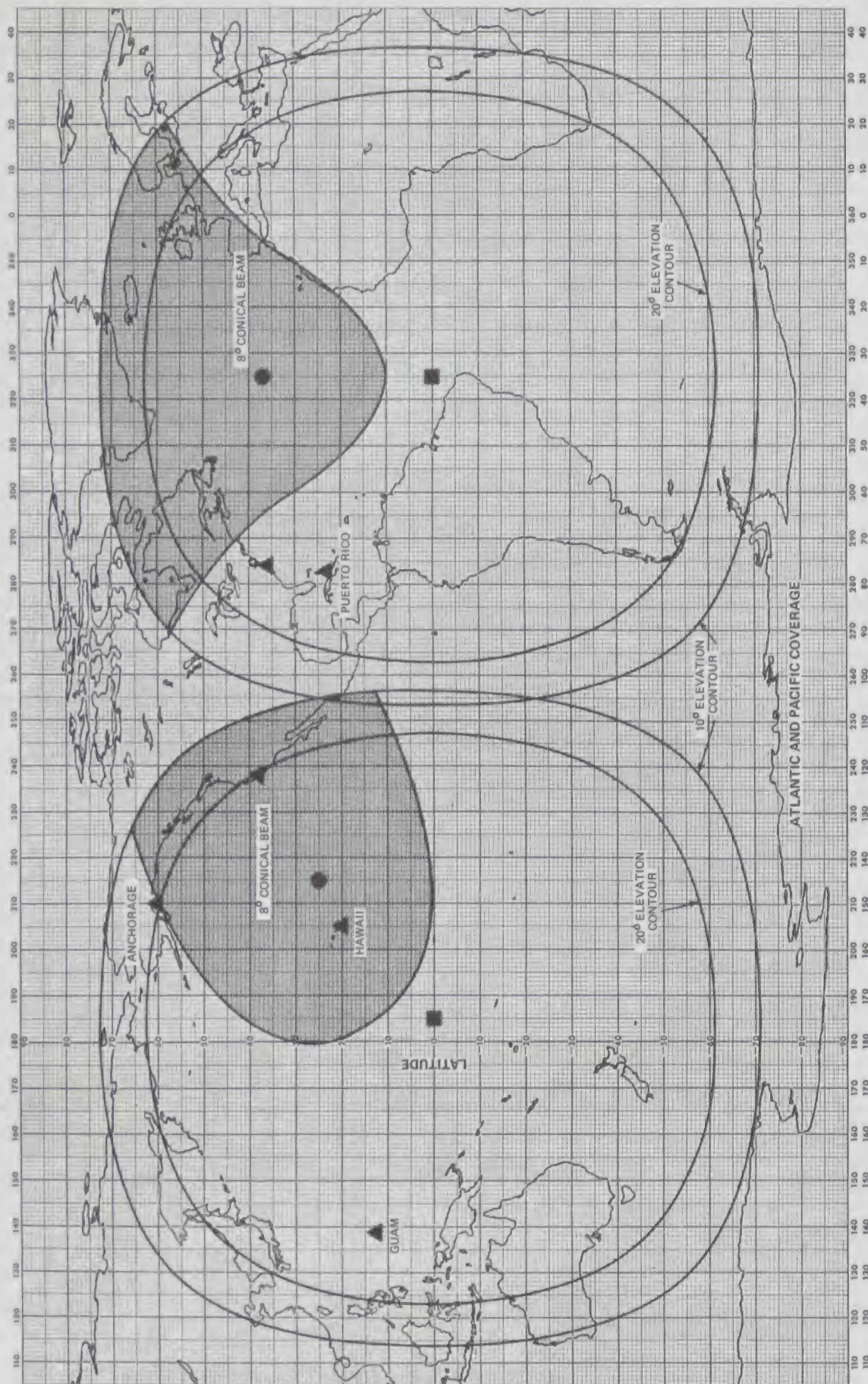
Initial Deployment

It is proposed that the first hybrid satellite be placed on station at approximately 175° W. Longitude. This station location, previously proposed in 1969 by Comsat, would provide VHF communications coverage to the major Pacific routes. In addition, a narrow UHF beam (8°) directed from this satellite location toward the northeast Pacific would permit the use of the UHF portion of the satellite system over routes between mainland U.S. and Hawaii, as well as the eastern segment of the north Pacific routes.

Location of a second hybrid satellite, approximately 60° to the east of the basic Pacific satellite, would provide overlapping coverage of the U.S. mainland-to-Hawaii routes. A narrow UHF beam from the eastern hybrid satellite would be directed to overlap with the beam from the Pacific satellite. This would provide the opportunity for two-satellite ranging tests at both VHF and UHF for the evaluation of independent surveillance in this area.

In addition, the initial location of the second hybrid satellite would provide the opportunity for VHF communications operations off of the east coast of the U.S. and throughout the Caribbean into Latin America.

The eastern satellite position would be maintained for one year and then moved to its Atlantic service position at 35° W. Longitude.



Atlantic and Pacific Coverage

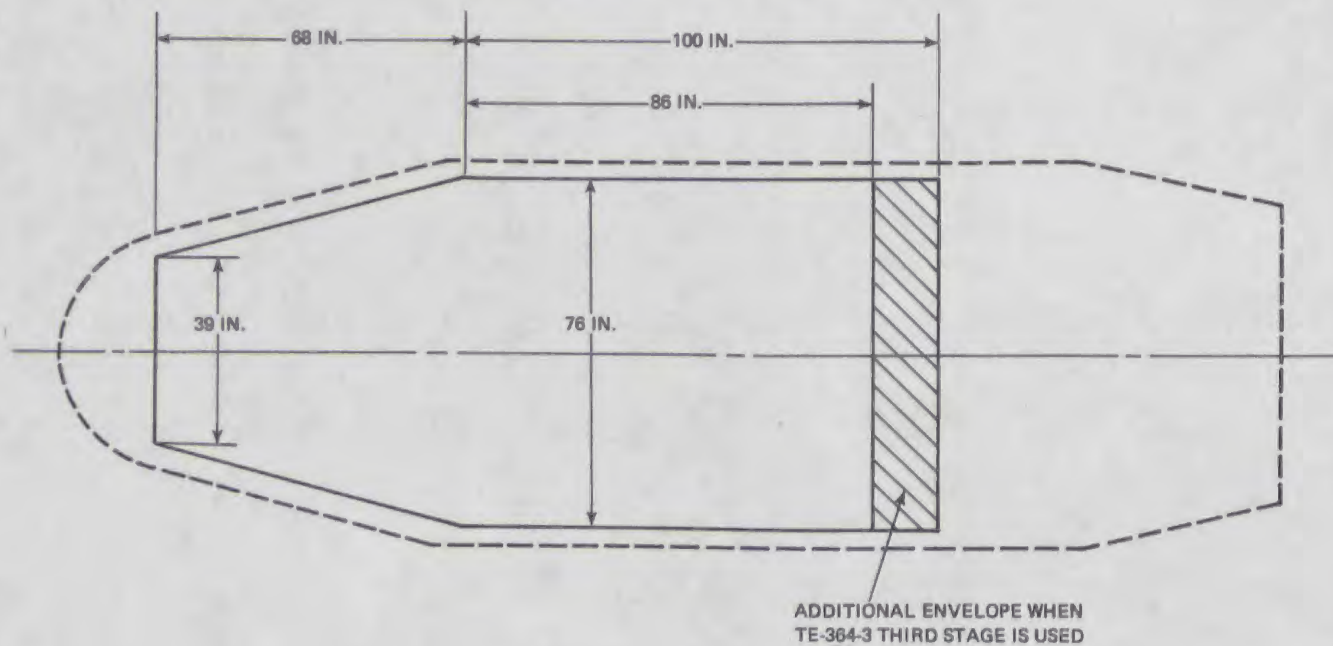
The second satellite, located over the eastern Pacific in the initial deployment scheme, would be moved during its second year of operation to a station at 35° W. Longitude. At that point in time, the VHF communications service would be extended to include the major Atlantic and Pacific routes.

Narrow beam UHF communications services would continue to be available in the region of the northeast Pacific, as well as in the Atlantic region. Coverage of the North Atlantic, as shown here, would require reorienting the UHF satellite beam after the move from its initial position to the Atlantic station. Other coverage arrangements could be provided using the same basic concept; however, those shown here are presented as being of potentially greatest interest.

III.3

SPACE SYSTEM CHARACTERISTICS

PRELIMINARY SPACECRAFT ENVELOPE WITH DELTA 84 IN. DIAM.
FAIRING AND TE364-4 THIRD STAGE



LAUNCH VEHICLE	USEFUL SPACECRAFT WEIGHT — POUNDS —
DELTA 903	521
DELTA 904	568

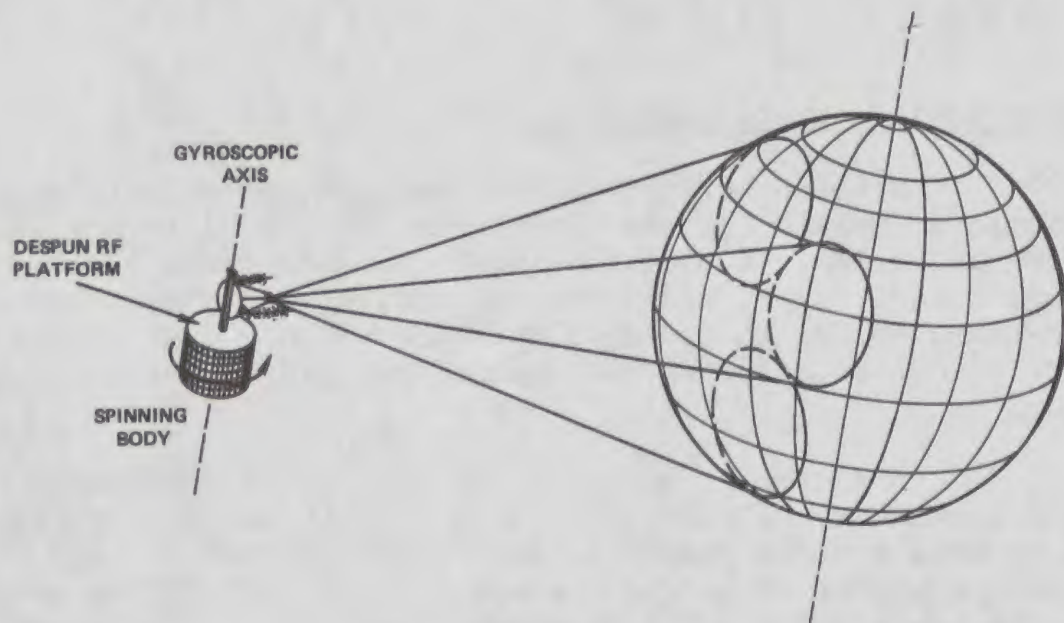
LAUNCH VEHICLE CHARACTERISTICS

G-5872

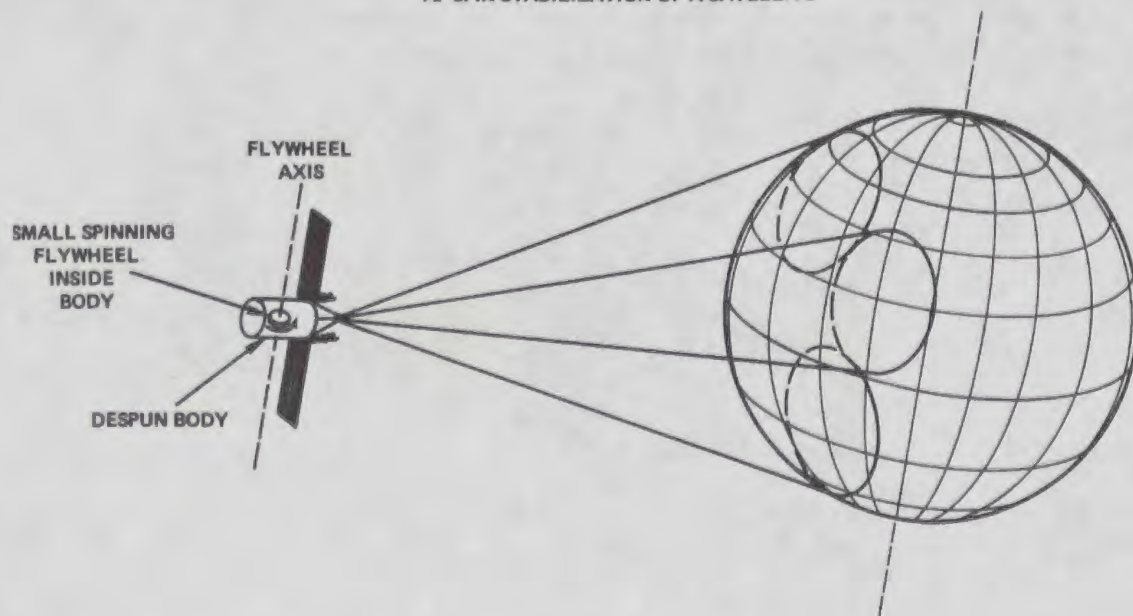
Launch Vehicle Characteristics

Each spacecraft will be launched one at a time on an improved version of the Thor-Delta which will be available in the 1972 time period. The improvements include a new second-stage engine, provision for increase in the number of zero-stage solids to either six or nine, a new lightweight inertial guidance system and an optional larger third-stage motor.

In addition, a new 84" fairing under consideration would provide a cylindrical spacecraft envelope 76" in diameter. Use of this vehicle with nine solids and the new fairing should provide a useful spacecraft weight of about either 521 or 568 lbs. in synchronous orbit, depending upon the choice of third-stage motor. These useful spacecraft weights are of the order of 65% and 80% greater, respectively, than the weight assumed in Comsat's previous all-VHF service proposal.



A. SPIN STABILIZATION OF A SATELLITE



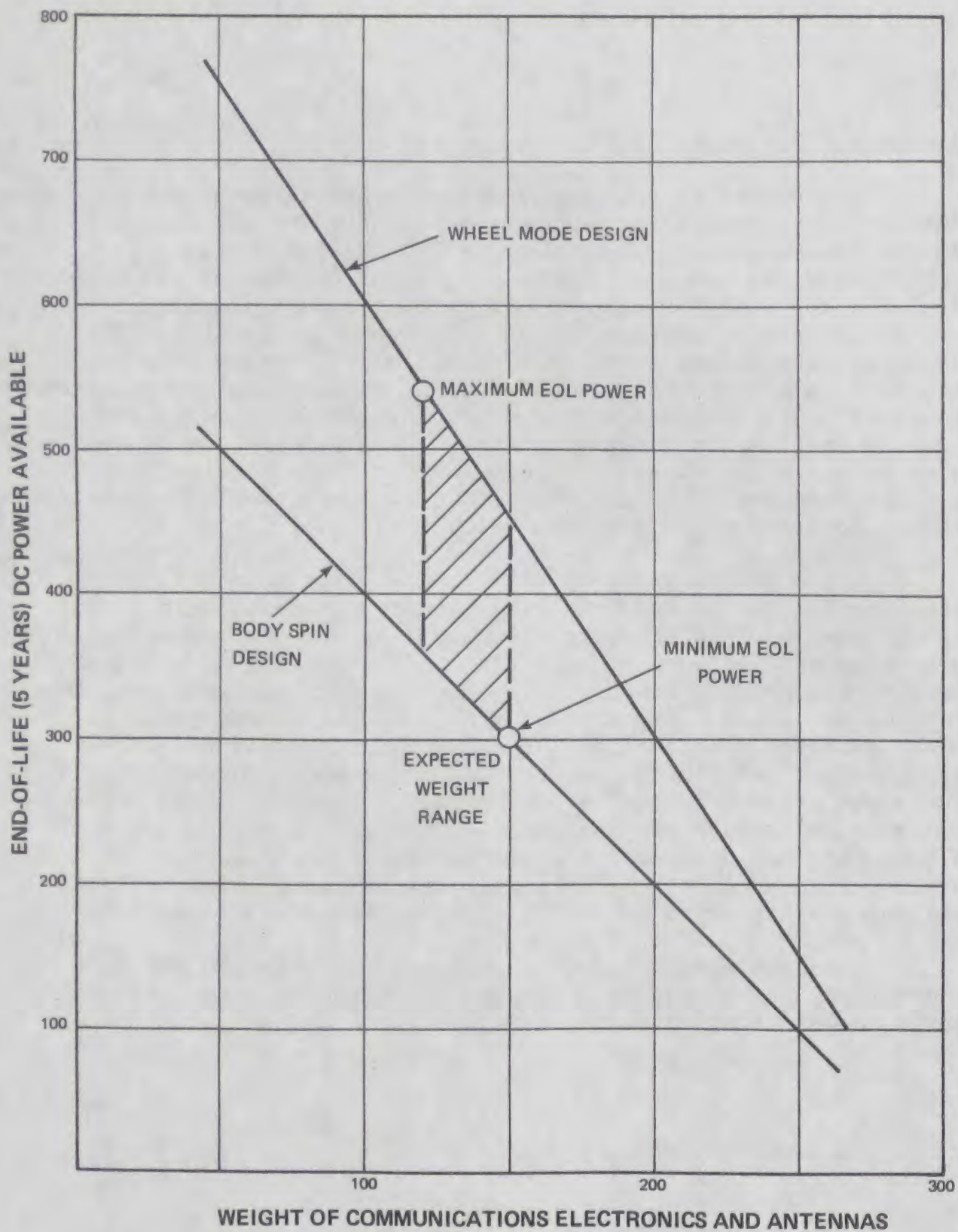
B. AN EXAMPLE OF A BODY-STABILIZED SATELLITE

Alternative Spacecraft Configurations

A number of spacecraft design concepts have been under study by Comsat for possible application to the aeronautical communications service mission. Of these, two approaches which use a combination of angular momentum and mass expulsion for stabilization appear to be the most promising. One features stabilization through the gyroscopic action accomplished by spinning the spacecraft body. This scheme has been used in all of the successful U.S. communications satellite programs. Basic stiffness of the stabilization system is provided by the large angular momentum of the spacecraft body and relatively simple onboard propulsion systems are required for in-orbit maneuvers. In addition, this approach simplifies the thermal control problems of the satellite.

The second approach utilizing angular momentum for stabilization is one in which the spacecraft body is stabilized through the use of a separate "flywheel" or set of "flywheels." Advantages of this approach include the possibility of antennas rigidly attached to the body of the spacecraft. In addition, it provides the possibility of deploying large solar arrays which can be oriented to track the sun for a maximum primary power-to-weight ratio. It would, however, require a more complex propulsion system and present a more severe thermal control problem. Considerable experience has been gained with this design concept in noncommercial programs, and demonstration of this approach for long-life synchronous orbit missions is now planned by the NASA and the Air Force in the ATS-F/G and LES-7 programs.

Comsat will, through continuing analysis and design competition, select one of these two basic concepts for the hybrid aeronautical satellite service.



DC POWER – COMMUNICATIONS WEIGHT TRADE-OFF FOR DELTA

Satellite Power System

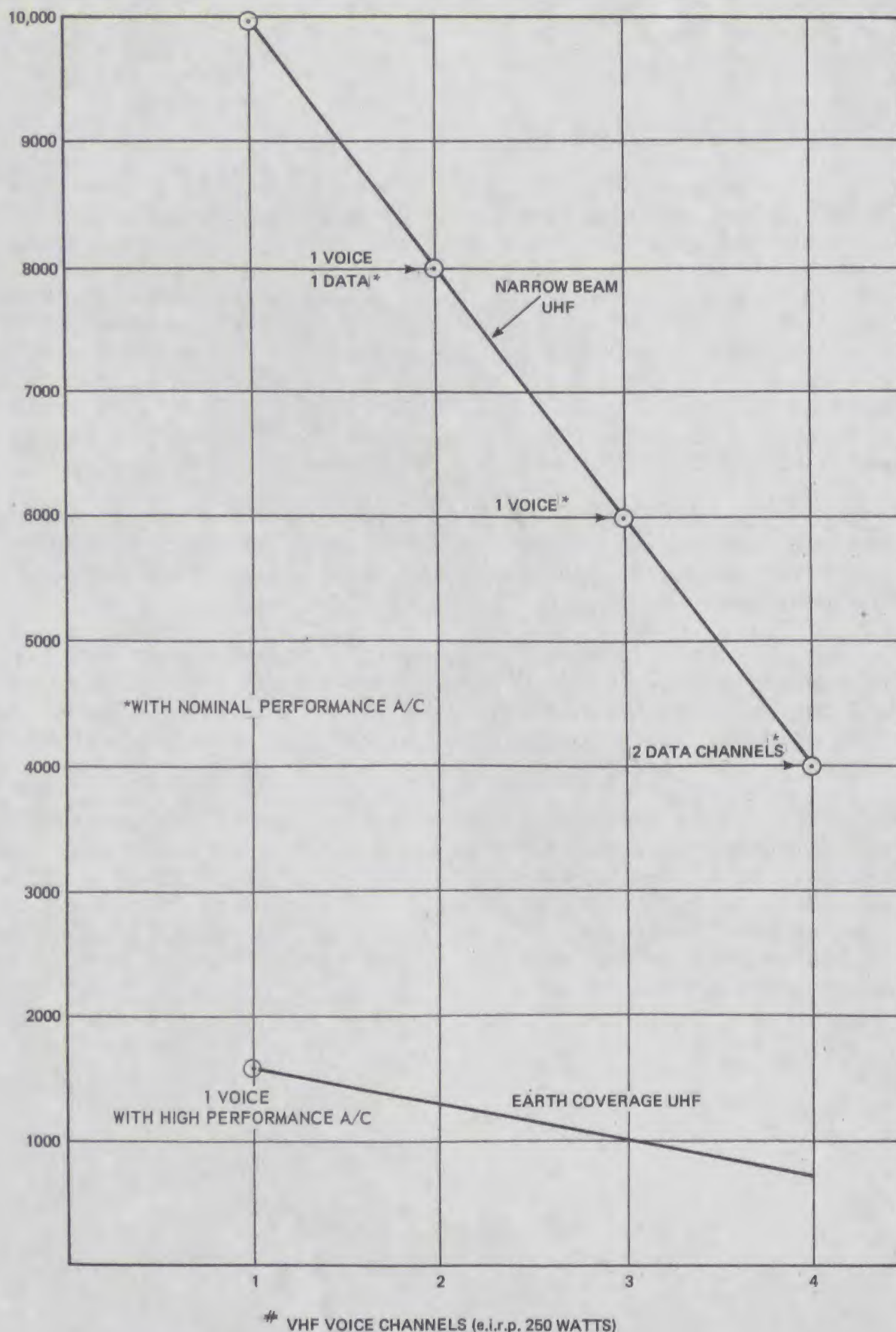
Primary power is a particularly important consideration for satellites providing services to aircraft. Analysis by Comsat of both the wheel-mode and body-spin designs indicate that somewhat in excess of 50% (~ 300 lbs.) of the payload should be available for power supply and communications equipment. The combined weights of VHF and UHF communications electronics and antennas are conservatively estimated to be in the range of 120-150 lbs. The allocation of residual satellite payload to power supply would yield between 300 and 350 watts end-of-life DC power for the body-spin design, and 450 to 540 watts end-of-life DC power for the wheel-mode design.

Pending the results of a more detailed design analysis and competition, the balance of this proposal assumes the most conservative case of 300 watts end-of-life (5 years) DC power of the body-spin design.

Secondary power (rechargeable batteries) is required to support short-time peak loads and services desired during eclipse periods when the satellite is not illuminated by the sun. This proposal assumes a requirement for full-service operation during eclipse periods.

It is anticipated that the high power transmitters used for communications functions will be completely solid state in design. As a result, the average DC power requirement will vary according to the actual utilization of the communications channels. This proposal conservatively neglects the potential improvement in system performance that could be achieved through various power sharing techniques.

UHF (e.i.r.p. WATTS)



SIMULTANEOUS VHF AND UHF TRANSMISSION CAPACITY

Simultaneous VHF and UHF Communications Capacity

The total satellite DC power available for communications may be divided between the VHF and UHF communications functions in various combinations. Since the performance objectives of the VHF aircraft installation are fairly well defined, a fixed satellite e.i.r.p. per channel of 250 watts (24 dBW) is assigned to VHF. Each such voice channel could be used alternatively for a data link at a transmission rate of 1200 bits-per-second with a substantially higher transmission margin than for voice operation.

The number of channels that can be derived from the UHF system depends upon the performance level of the aircraft terminal and the satellite UHF e.i.r.p., which in turn depends upon which satellite antenna is used (earth coverage or narrow beam). For a nominal performance aircraft system (gain-to-noise temperature ratio $(G/T) = -26 \text{ dB/}^{\circ}\text{K}$), a satellite UHF e.i.r.p. requirement would be about 6000 watts (38 dBW) for one voice channel and 2000 watts (33 dBW) for one 1200 bit per second data channel. Use of a high performance aircraft terminal ($G/T = -20 \text{ dB/}^{\circ}\text{K}$) would reduce the satellite e.i.r.p. required per channel by a factor of 4.

OPERATING MODE	A	B	C
VHF COMMUNICATIONS	2 CHANNELS	3 CHANNELS	4 CHANNELS
UHF COMMUNICATIONS	VOICE - 1 (4) DATA - 1 (4)	VOICE - 1 (3) DATA - 0 (3)	VOICE - (2) DATA 2 (2)
UHF RANGING			
HOUSEKEEPING			

- DATA CHANNELS ARE AT 1200 BPS
- NUMBERS IN PARENTHESES ARE FOR HIGH PERFORMANCE AIRCRAFT INSTALLATIONS

SATELLITE OPERATING MODES

G-5872

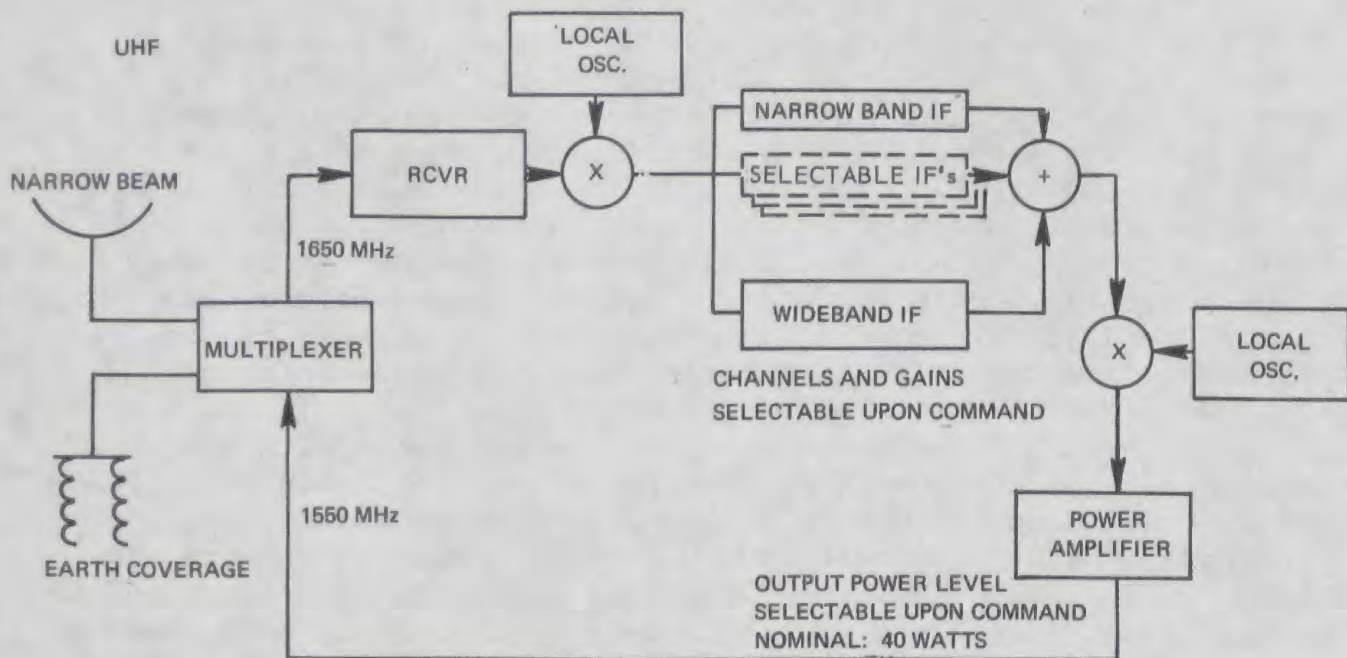
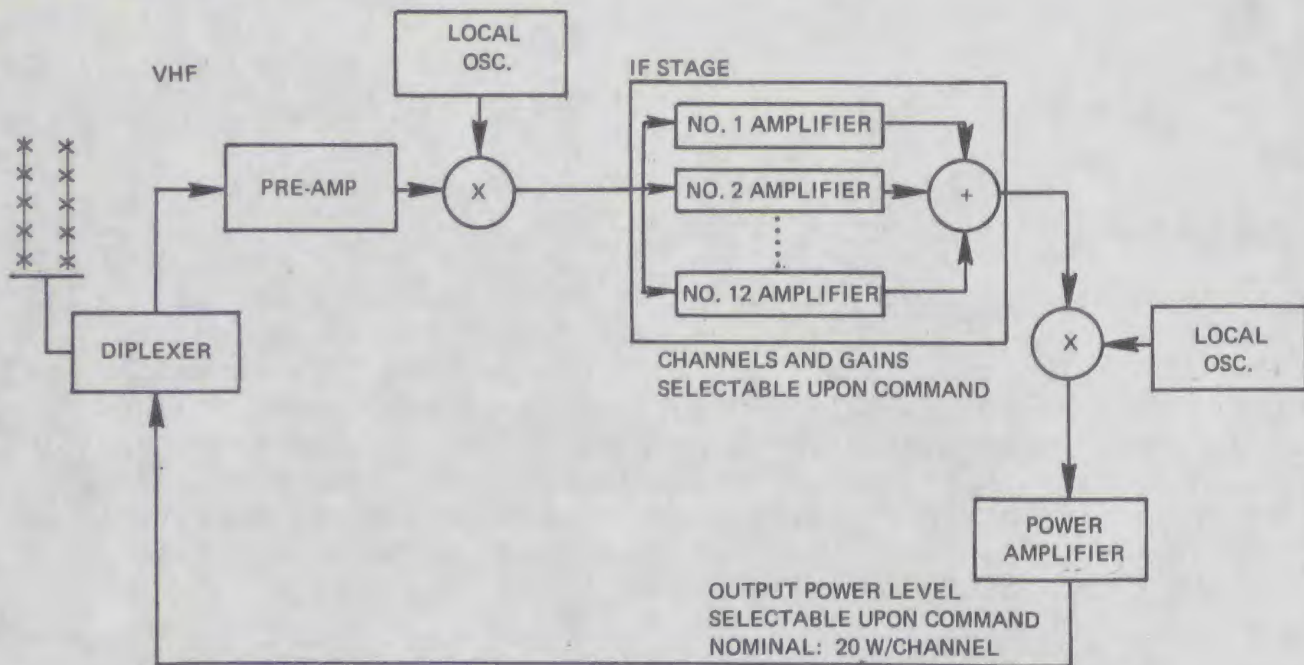
Satellite Operating Modes

The accompanying chart shows the proposed set of satellite operating modes. The size of the blocks represent the satellite power allocation to each function. In normal operation, an essentially constant primary power level will be required to maintain the housekeeping (tracking, telemetry and command) functions. In addition, it is proposed to maintain a UHF ranging channel continuously available for all operating modes. The balance of the satellite power would be allocated between VHF and UHF communications.

It is assumed in this selection of modes that if a VHF ranging function were desired, it would be multiplexed with a voice or data link using one of the VHF voice bandwidth channels.

The channels which can be derived at UHF, as noted previously, will depend upon the performance level of the aircraft installation. For the three operating modes, channel capacities for two different aircraft performance levels are indicated. Power allocated for a 1200 bit-per-second data link should be about one-third of the power allocation for voice at UHF. At VHF, it is conservatively assumed that an entire voice channel capacity would be used for a 1200 bit-per-second data channel pending further tests to determine the effects of propagation variables on data transmission error rates in this band.

Mode B is proposed for initial operations with the Pacific satellite - that is, 3 VHF channels plus 1 each UHF voice and ranging channel. Mode A is proposed for initial Atlantic operations; this would substitute a UHF data channel for one VHF channel. Evaluation programs requiring the simultaneous availability of one each voice, data and ranging channel in both frequency bands could be accomplished in operating Mode A for UHF aircraft terminals of nominal performance. For high performance UHF aircraft installations, such evaluation programs could be accomplished in any operating mode with the simultaneous provision of substantial additional communications capacity.



COMMUNICATIONS FUNCTIONAL BLOCK DIAGRAMS

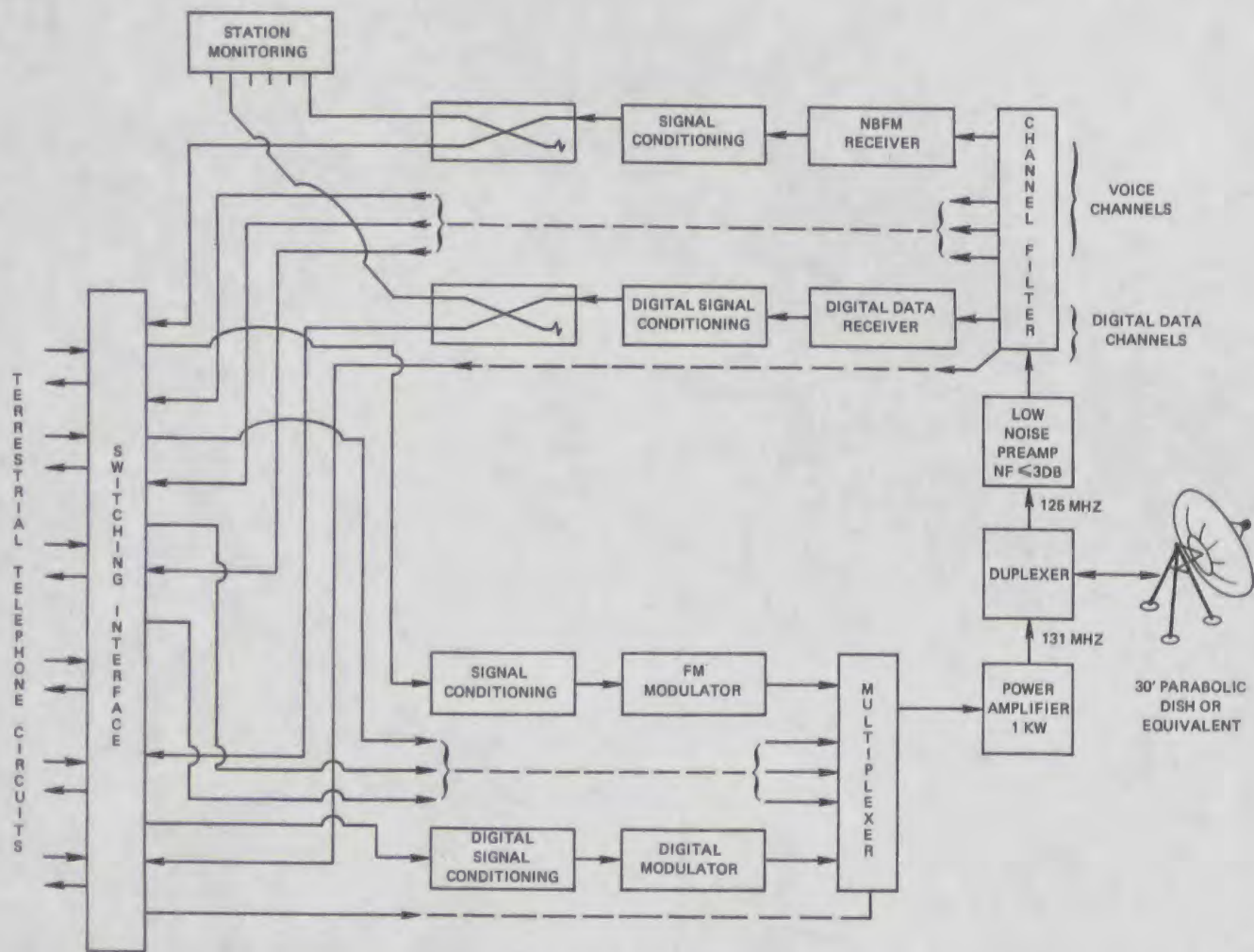
Communications Subsystem

The VHF repeater design is based upon use of the frequency plan suggested in ARINC Characteristic 566. For the particular operating mode in use, the required number of channels may be selected from 12 uplink/downlink frequency pairs available in the satellite. The selected channels will be activated by ground command. The planned satellite e.i.r.p. per VHF voice channel is 24 dBW.

The UHF repeater will be similar in design to the VHF repeater with a number of selectable narrowband IF channels. In addition, at least one wideband mode will be provided to permit the testing of wideband ranging and multiple access techniques. The gain of each channel will be adjustable by ground command in order to provide the required mix of voice and data services.

III.4

GROUND FACILITIES



Q-5872

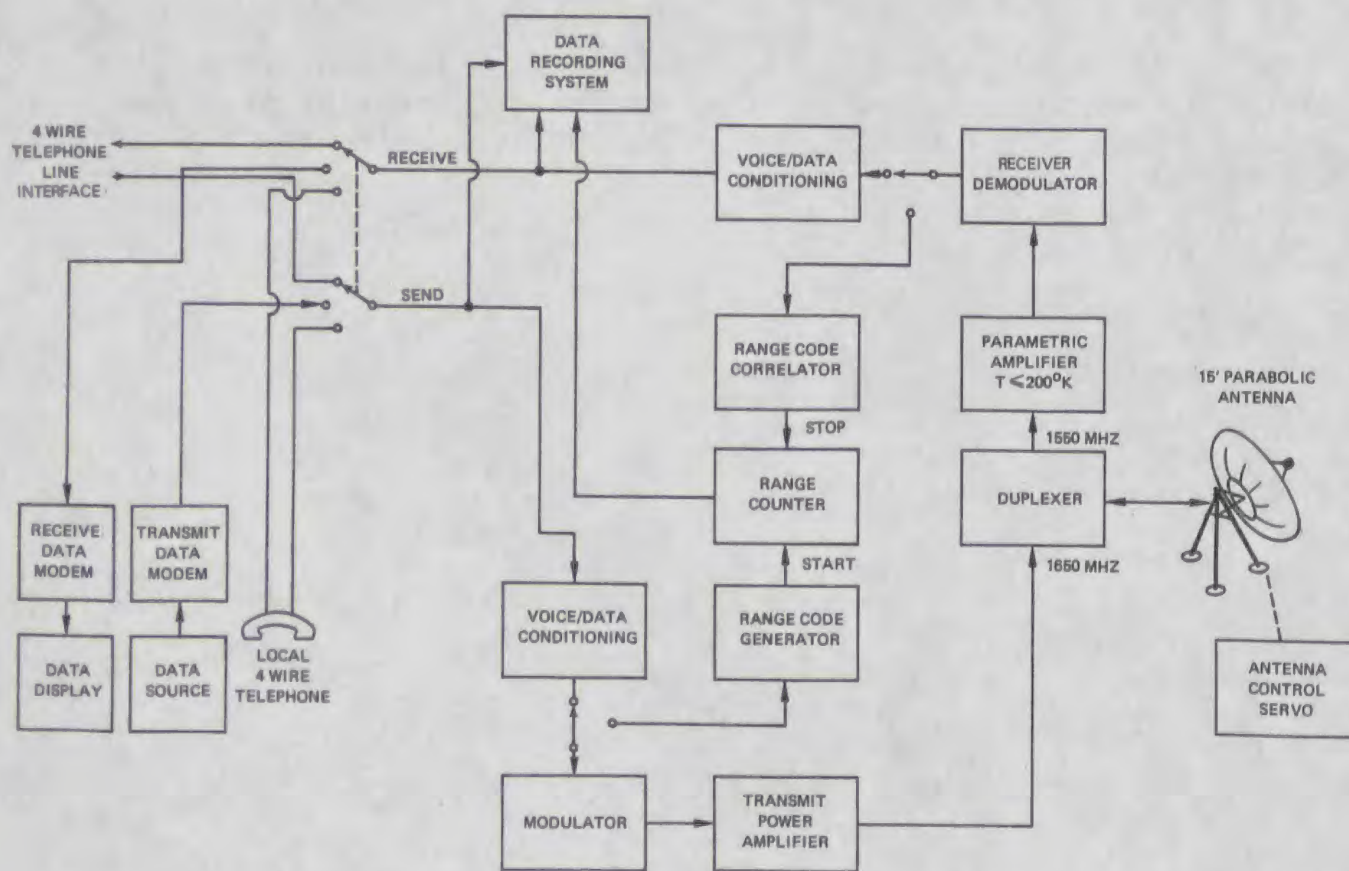
VHF EARTH STATION

VHF Earth Station

Each VHF earth station will be capable of operating on any combination of channels which may be activated in the satellite. Provision will be made for handling the desired mix of voice and data transmission.

One station for each satellite will be provided with the necessary additional equipment for technical monitoring of the communications system to insure the integrity and continuity of the service.

Special care will be given to the selection of the earth station antenna design to minimize any potential problems of radio frequency interference. The VHF terminals will be located at existing U.S. earth station sites or other facilities available to Comsat.



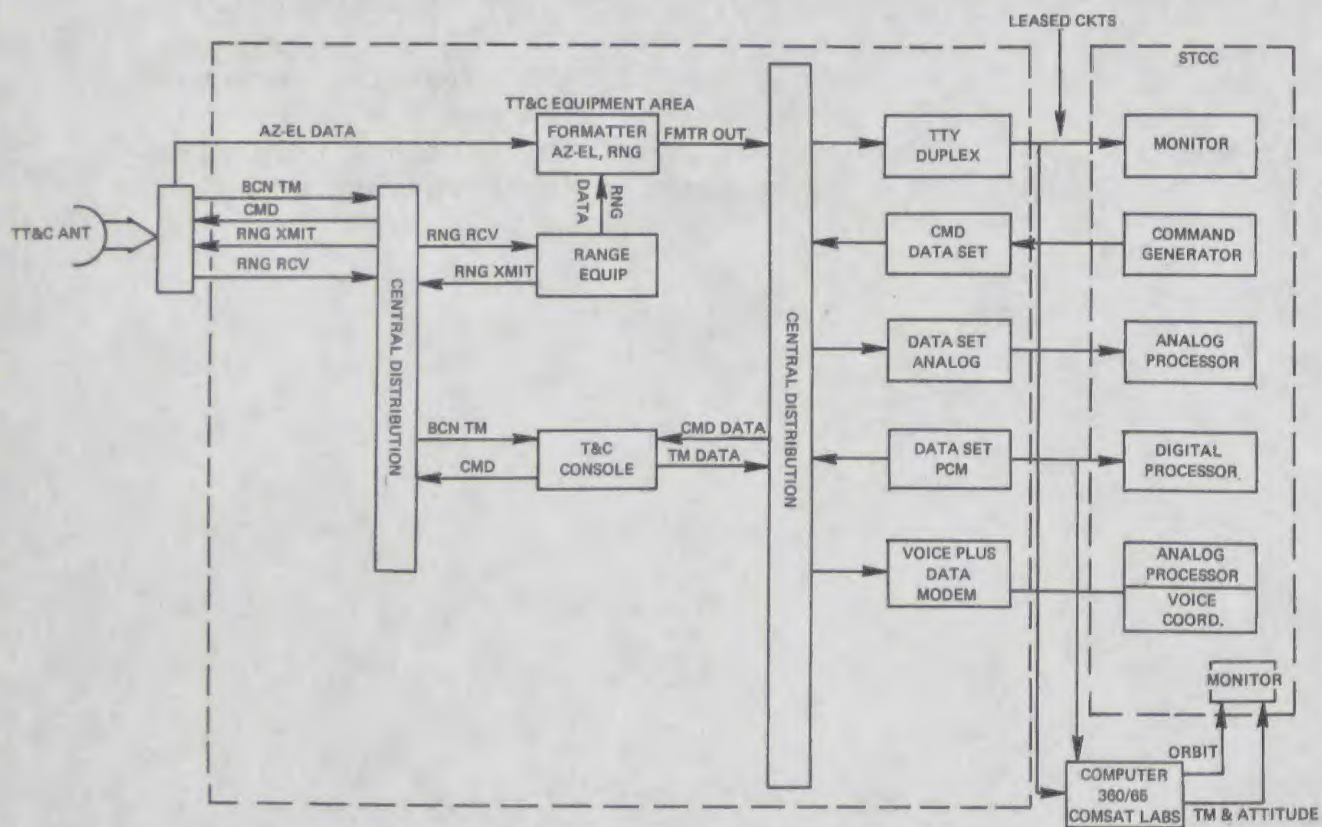
TYPICAL UHF STATION CONFIGURATION

G-6672

UHF Earth Station

A UHF transportable station will be provided for each hybrid satellite in orbit. The station will be co-located at an existing U.S. earth station site, or at other facilities available to Comsat. In addition to the equipment required for normal communications functions, the stations will be equipped to conduct the voice, data, ranging, multiple access and propagation experiments planned as part of the UHF test program.

The stations will include a 15-foot parabolic antenna, low-noise preamplifier, a transmitter and receiver, a high-power amplifier, and associated equipment for test and recording, to permit the comparative evaluation of a large variety of communications techniques.



SPACECRAFT TECHNICAL CONTROL SYSTEM

G-5872

Spacecraft Technical Control System

The spacecraft technical control system is comprised of the necessary elements for monitoring the condition, location and attitude of the satellite, as well as the procedures necessary to permit rapid response to required changes in the system via command.

This system will consist of the tracking, telemetry and command station, the control center and the computation facilities necessary for technical management of the satellite in orbit. The control center is located at Comsat Headquarters in Washington, D. C. It is at this location that the necessary analysis in monitoring functions will be performed as well as decisions on the issuance of commands to the satellite.

The computation facility is located at Comsat Laboratories in Clarksburg, Maryland. This facility is connected to the Comsat Control Center via leased lines.

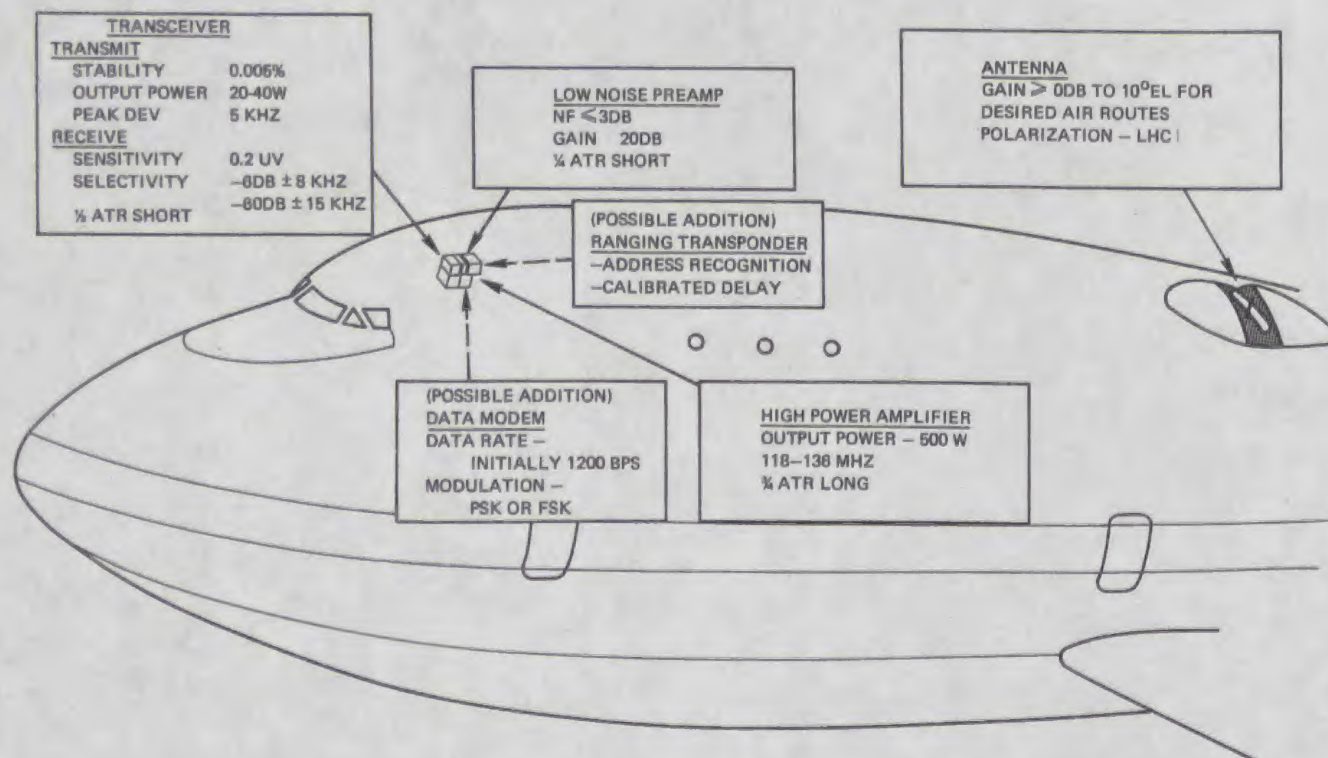
The tracking, telemetry and command functions will be provided at existing earth station sites. The station will be provisioned with the equipment necessary to provide the RF link with the satellite, tracking, telemetry and command equipment, as well as data formatting equipment required to interface the station via leased line to the Comsat computer and the Spacecraft Technical Control Center.

The telemetry and command equipment on the spacecraft will be operable for normal T&C functions and, in addition, will have a transponder mode for determination of its slant range. Command tones or range tones will be transmitted to the spacecraft and the satellite beacon signal will be modulated with either PCM telemetry data or transponded range tones. The beacon modulation will be selected via command from the Spacecraft Technical Control Center and relayed to the spacecraft by the Tracking Telemetry and Command station.



III.5

AIRCRAFT EQUIPMENT



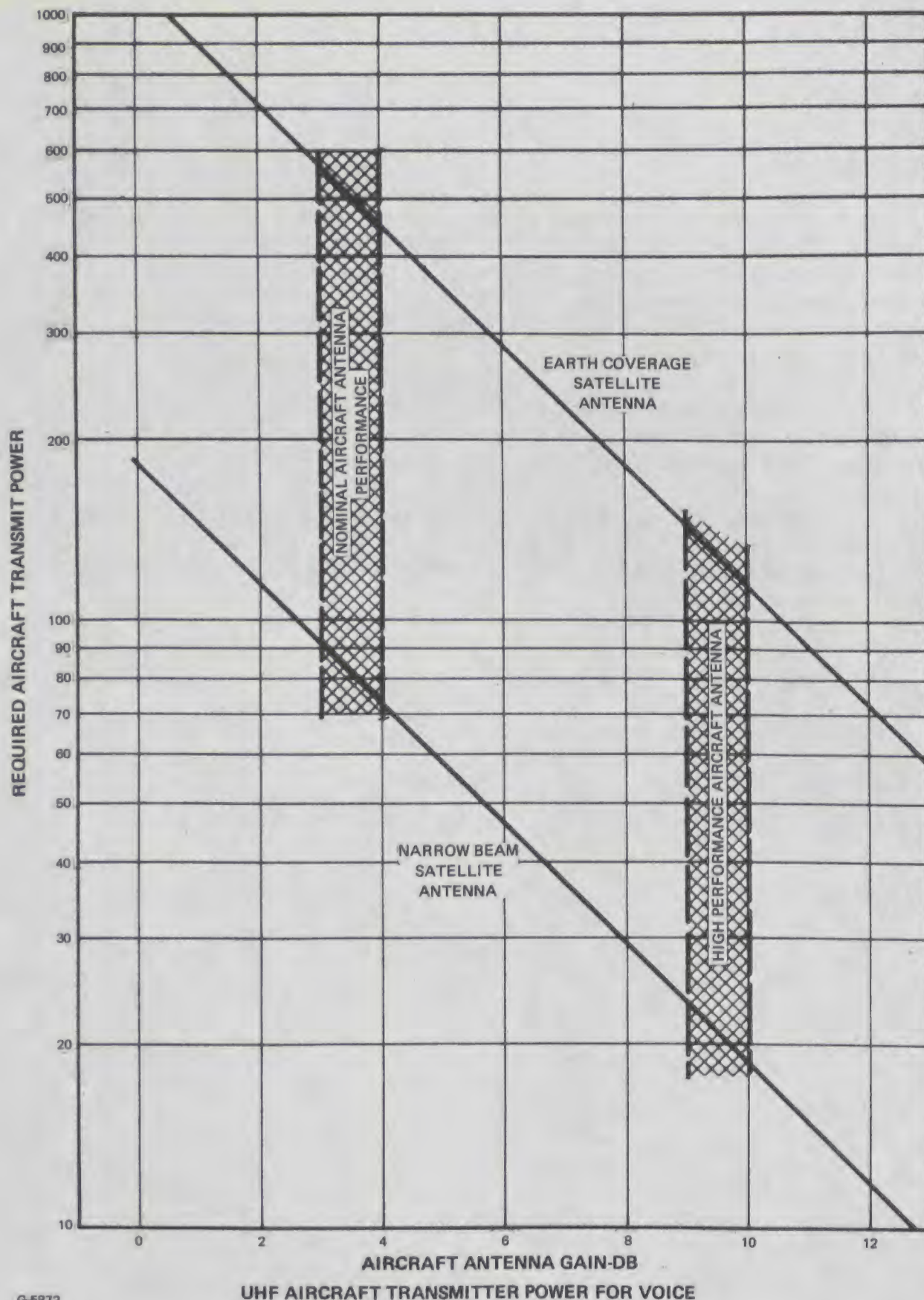
VHF AVIONICS

VHF Avionics

The VHF aircraft equipment is assumed to be consistent with ARINC Characteristic 566 for voice operations. A high power transmitter, low noise preamplifier and FM receiver will be required, together with an antenna having a minimum gain equivalent to a 0 dB circularly polarized antenna over the required coverage angles.

Future additions to this equipment for other functions could include the necessary circuitry for a ranging and/or a suitable data modem.

Since the voice communications function is the one which requires the largest allocation of satellite power, a continuing effort to improve upon the voice modulation parameters would be most desirable.

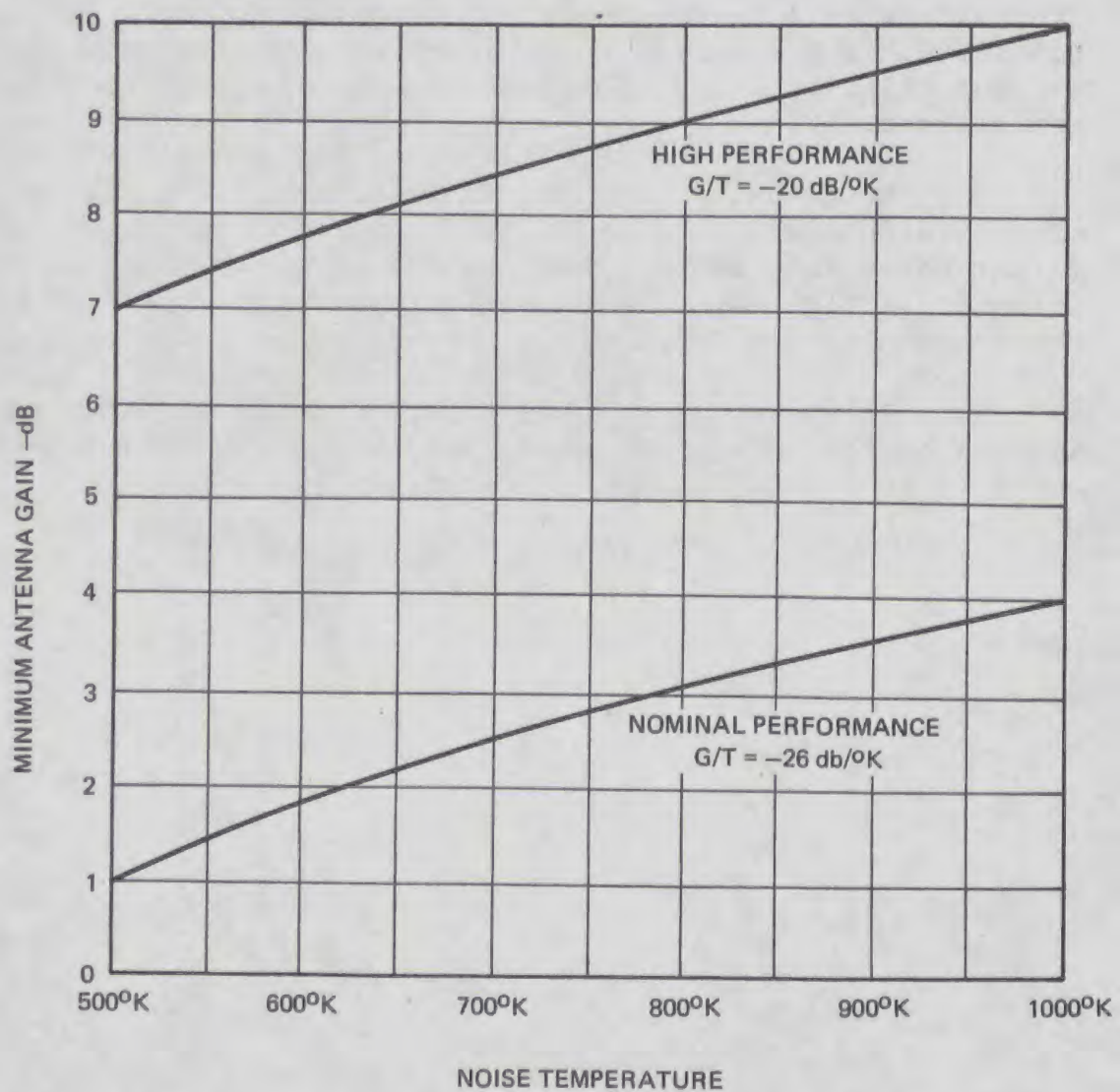


UHF Aircraft Transmit Power Requirements

The highest power requirement for the aircraft transmitter will be for voice transmission as it is for the satellite. The required power level will depend upon the antenna gain, both for the satellite receiver and the aircraft transmitter.

A nominal minimum aircraft antenna gain in the range of 3 to 4 dB would require on the order of 80 watts of transmitter power when transmitting to the narrow beam satellite antenna. A high performance aircraft antenna could reduce this requirement to the order of 20 watts.

If it were necessary to transmit to an earth coverage antenna on the satellite, these transmit power requirements would be increased by about a factor of 6.



UHF AIRCRAFT RECEIVE PERFORMANCE REQUIREMENTS

UHF Aircraft Receive Performance

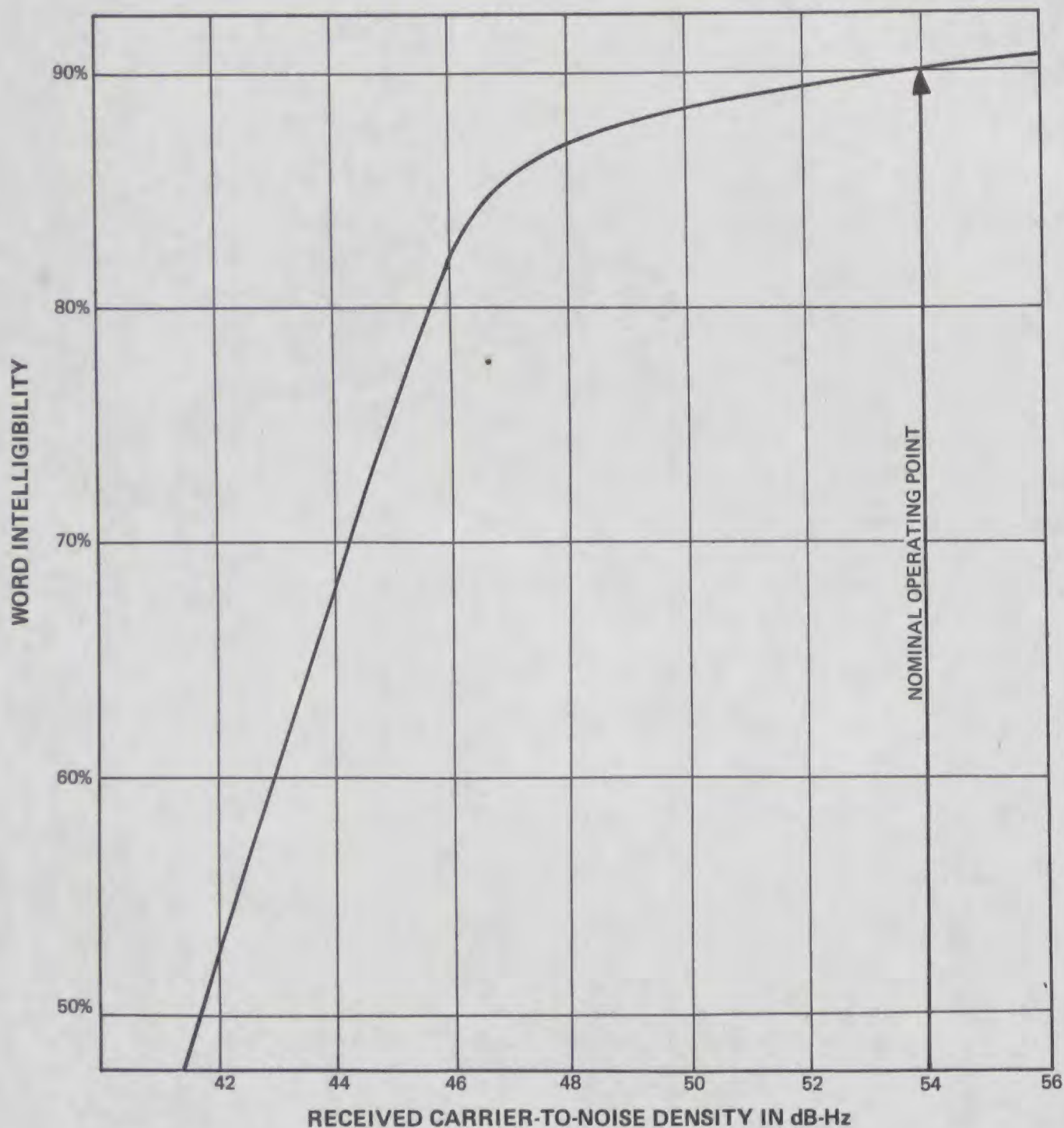
In order to assess the UHF channel capacity of the system, two typical performance objectives are defined for UHF aircraft receive stations.

A "nominal performance" aircraft receive terminal is defined as having a gain-to-noise temperature ratio $(G/T) = -26 \text{ dB/}^{\circ}\text{K}$. This performance would be achieved, for example, with a minimum aircraft net receive gain of 3 dB and a system noise temperature of about 800°K .

A second type of aircraft terminal is defined as a "high performance" terminal with a $G/T = -20 \text{ dB/}^{\circ}\text{K}$. This performance would be achieved with the same system noise temperature as for the nominal performance system and a minimum antenna gain of 9 dB.

III.6

VHF OPERATIONS



MEASURED WORD INTELLIGIBILITY ON A TYPICAL VHF RECEIVER
BUILT TO ARINC CHARACTERISTIC 566

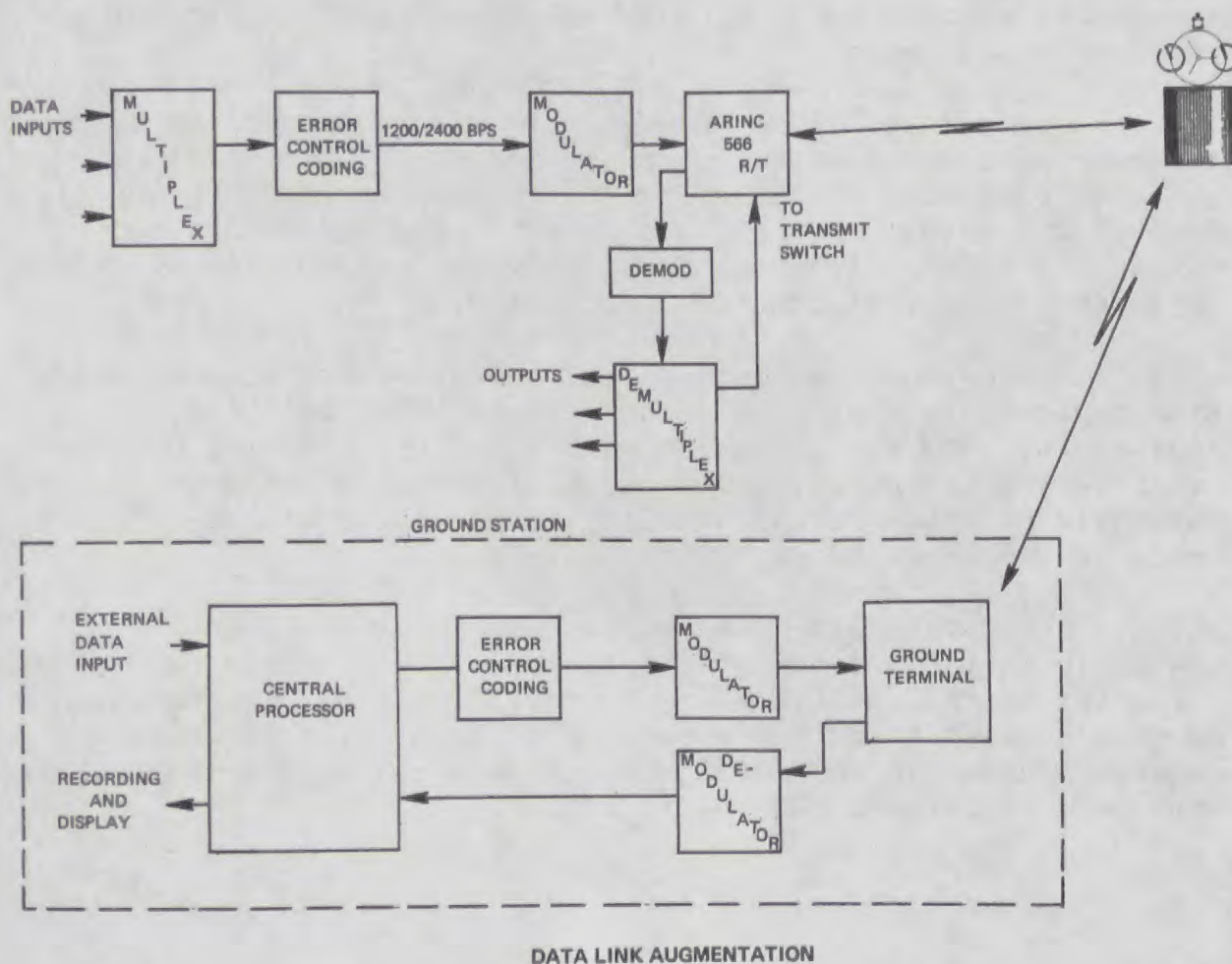
VHF Voice Performance

The quality and reliability of the VHF communications system will be limited by the performance of the link from satellite to aircraft receiver. One useful criterion for acceptability of a voice link is the intelligibility of the received voice signal.

Recently, tests were performed on a production FM receiver designed to ARINC Characteristic 566. The test material consisted of a list of 100 PB (phonetically balanced) words. The intelligibility increased from about 50% to above 85% as the carrier-to-noise density was increased from 42 dB-Hz to 48 dB-Hz (approximate receiver threshold).

Previous comparative tests have led to the conclusion that typical air traffic control message intelligibility approaching 100% can be achieved with a link producing on the order of 60% to 70% word intelligibility. This would set a threshold of voice intelligibility at a carrier-to-noise density ratio in the vicinity of 43 to 44 dB-Hz.

A carrier-to-noise density of 54 dB-Hz would be available in the absence of the effects of propagation and noise variables on the satellite-to-aircraft link. The transmission margins available are therefore on the order of 6 dB above receiver threshold and 10 dB above an assumed word intelligibility threshold of between 60% and 70%.



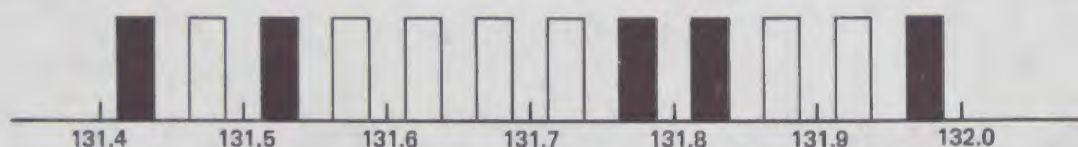
G-8672

VHF Data Link

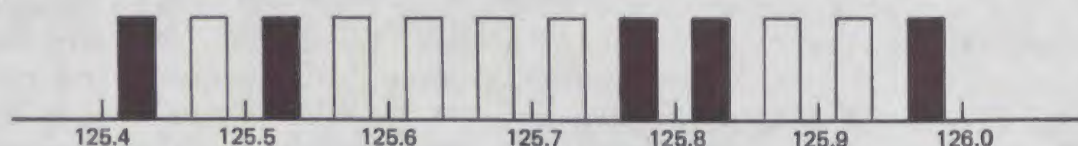
Improvement in efficient use of satellite channels demands the use of data transmission techniques for routine traffic at the earliest feasible date. Each VHF voice channel could be used alternatively to accommodate voice transmission or data and ranging as required. The system would be reconfigured to supply a changing mix of voice and data services as the use of data transmission develops. For example, it would be possible to use one or more satellite channels at reduced power output to support low to moderate data rates as an alternative to dedicating a full power voice channel to data transmission.

A number of methods are possible for integrating a ranging system with the data link. One of the most easily implemented would utilize the address recognition feature of an aircraft polling system. In such a system, once the aircraft transponder has recognized its address, it would, with a known or calibrated delay, retransmit its address, data and a synchronous ranging tone. The round-trip range between ground station, satellite and aircraft is proportional to the time delay (phase shift) between transmitted and received signals at the ground station.

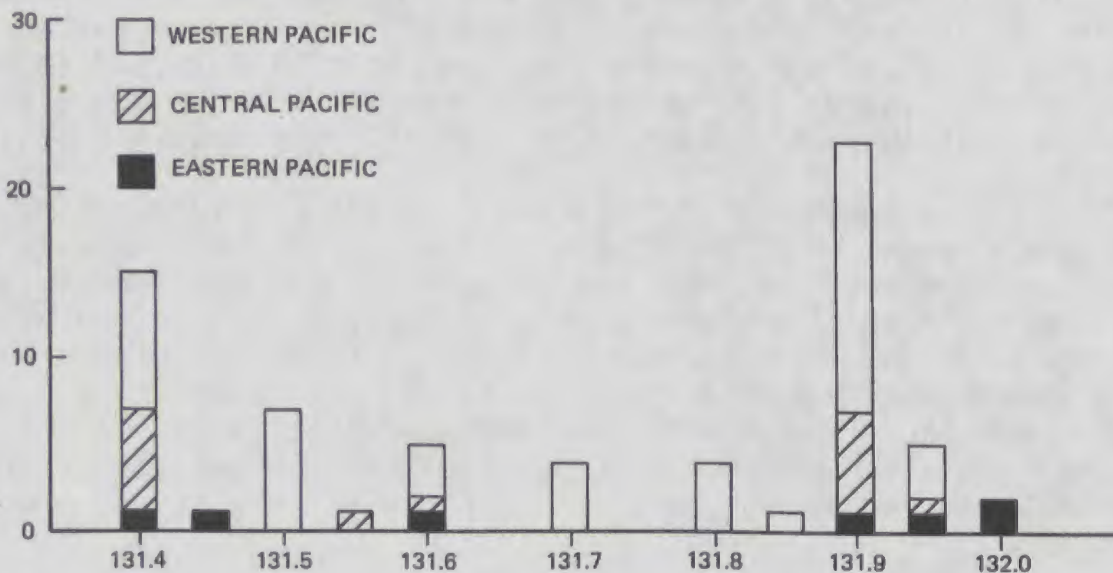
A)
UP
LINK



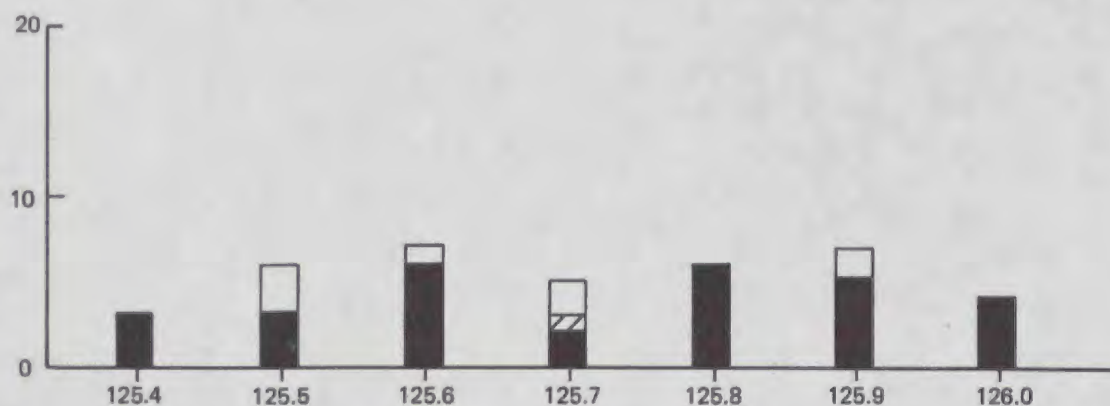
B)
DOWN
LINK



C)
PRESENT
ASSIGNMENTS
IN
UP-LINK
BAND



D)
PRESENT
ASSIGNMENTS
IN
DOWN-LINK
BAND



TYPICAL VHF FREQUENCY PLAN

VHF Frequency Plan

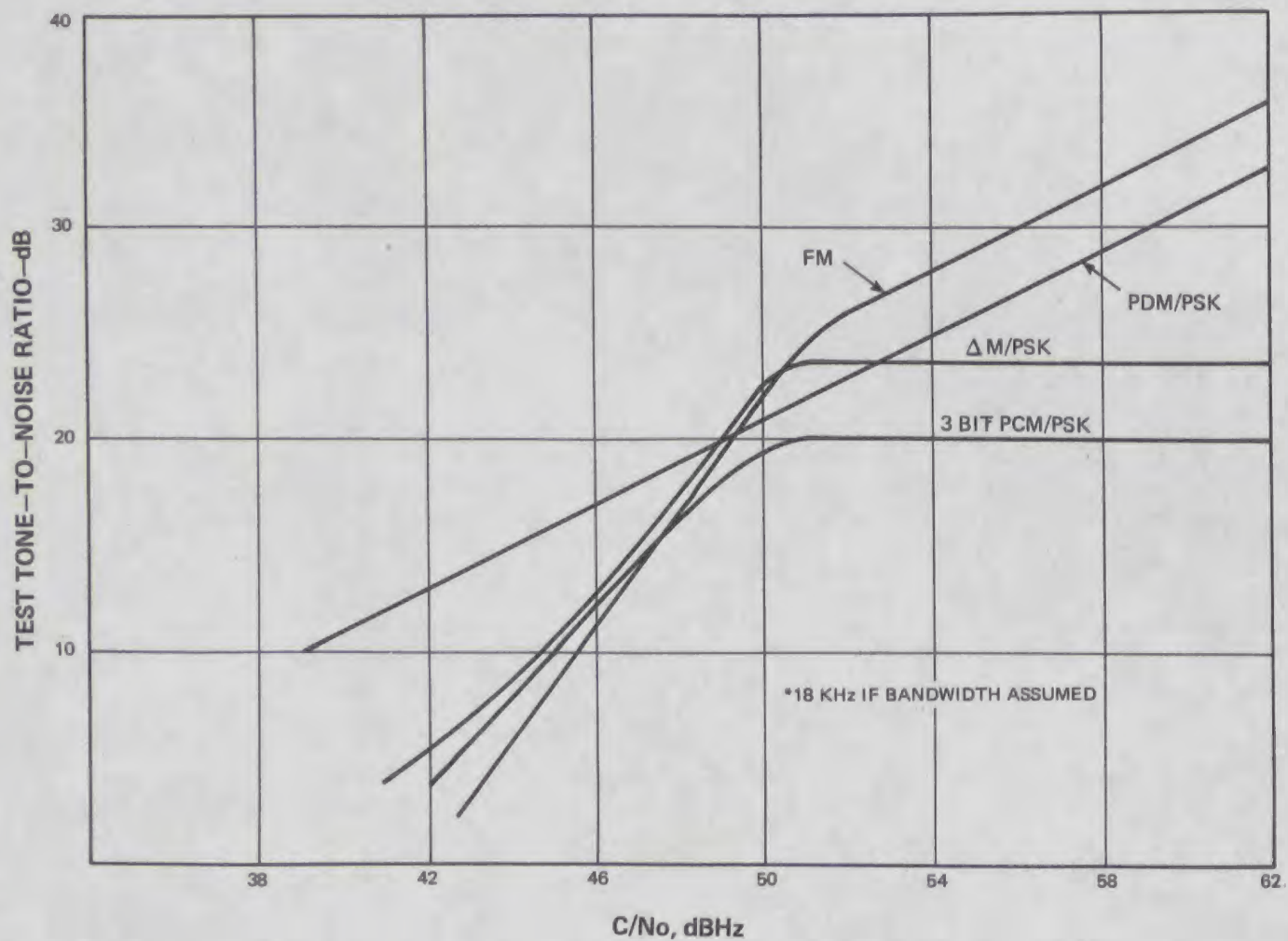
The VHF channelling plan assumes the use of frequencies at 50 kHz intervals between 131.425 and 131.975 MHz for the uplink. Downlink frequencies would be exactly 6 MHz below the uplink frequency.

The two technical considerations having primary influence on the choice of frequency assignments are potential interference between satellite and conventional services and intermodulation product distortion in the satellite. The accompanying chart shows a typical selection of up to five satellite frequency pairs chosen to minimize intermodulation distortion. Also shown are the present assignments in the Pacific area for the uplink and downlink bands. The western Pacific zone includes eastern Asia and Australia; the central zone is comprised of Hawaii, New Zealand and the South Pacific Islands; and the eastern zone includes the west coast of the United States.

Definitive frequency plans will be arranged for both the Pacific and Atlantic regions in collaboration with the users and others concerned. Provision of 12 channel pairs in the satellite will permit adjustment of the frequency plan, depending upon the satellite operating mode and the experience gained in system operation.

III.7

TEST PROGRAMS



EXPECTED PERFORMANCE OF NARROWBAND* VOICE TECHNIQUES

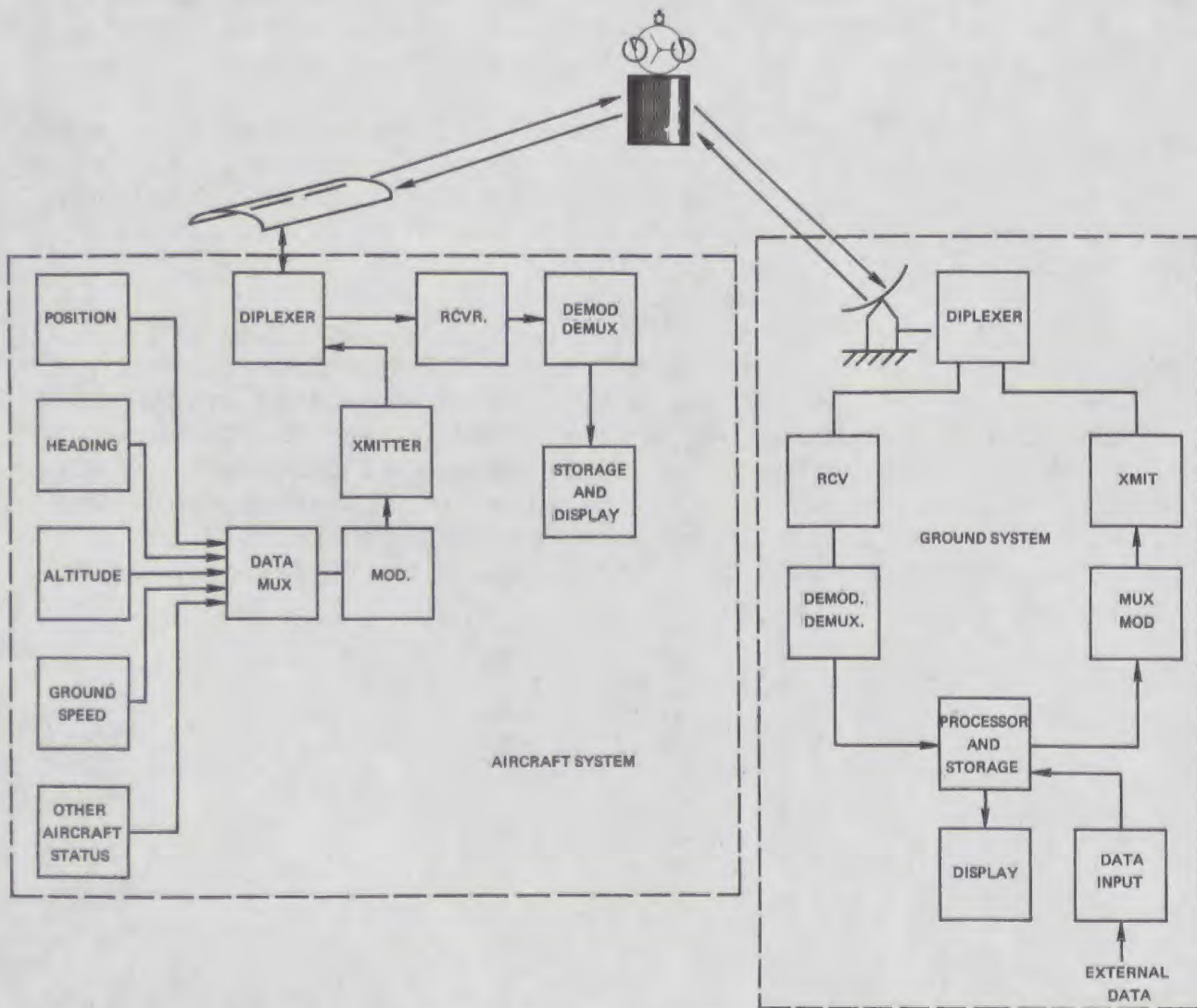
G-5872

Advanced Voice Modulation Experiments

The anticipated continued use of satellite channels for voice communications into the indefinite future points toward the desirability of testing improved voice processing and modulation techniques. Techniques should be evaluated with a number of objectives in mind. These include reduction of the average satellite power required to support voice transmissions to aircraft, and reduction of susceptibility to the disruptive effects of fading and noise on the transmission path.

Shown here are the expected performance characteristics of a number of narrowband voice modulation techniques. These techniques could have particular applicability to VHF satellite communications channels; and they are currently under comparative evaluation at Comsat Laboratories.

At UHF, because of the expected availability of greater bandwidth, digital communications techniques such as Pulse Code modulation and Delta modulation should be practical. In addition, wideband spread spectrum techniques may be worthy of investigation for combatting the effects of multipath. Each of these techniques has its own particular attractive features, ranging from the extension of intelligibility threshold to relative invulnerability to effects of the nonlinear properties of satellite repeaters.



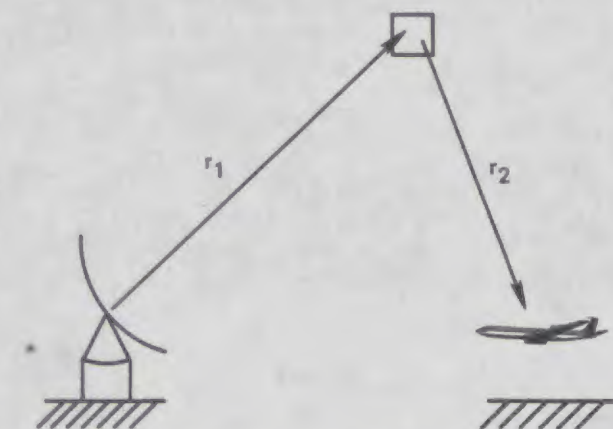
TYPICAL DATA COMMUNICATIONS TEST SYSTEM

0-8872

Data Transmission Tests

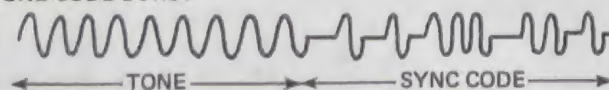
A continuing process of evaluation and improvement can be anticipated in the application of data transmission techniques to air/ground communications via satellite. Among the alternatives which could be investigated at both VHF and UHF using the proposed service are:

1. Multiplexing of low data rate channels (75 to 150 bauds) on the same channel used for voice.
2. Transmission at data rates of 1200 and 2400 bits per second in a voice frequency channel.
3. Improvements in error performance using redundancy encoding principles.
4. Use of spread spectrum techniques as a means for combatting multipath effects. (This is likely to be more attractive at UHF frequencies where wider bandwidth channels may be more readily available.)
5. Study of modulation techniques most suitable in each frequency band, for example, PSK, DPSK, FSK.
6. Test and evaluation of roll-call and other multiple access methods to improve efficiency of satellite capacity utilization.



r_1 = DISTANCE FROM EARTH STATION TO SATELLITE
 r_2 = DISTANCE FROM SATELLITE TO AIRCRAFT

- TONE CODE BURST



- FIXED CW TONE PACK



- BINOR CODE



- PN CODE



- FREQUENCY SWEEP (CHIRP)



RANGING TECHNIQUES

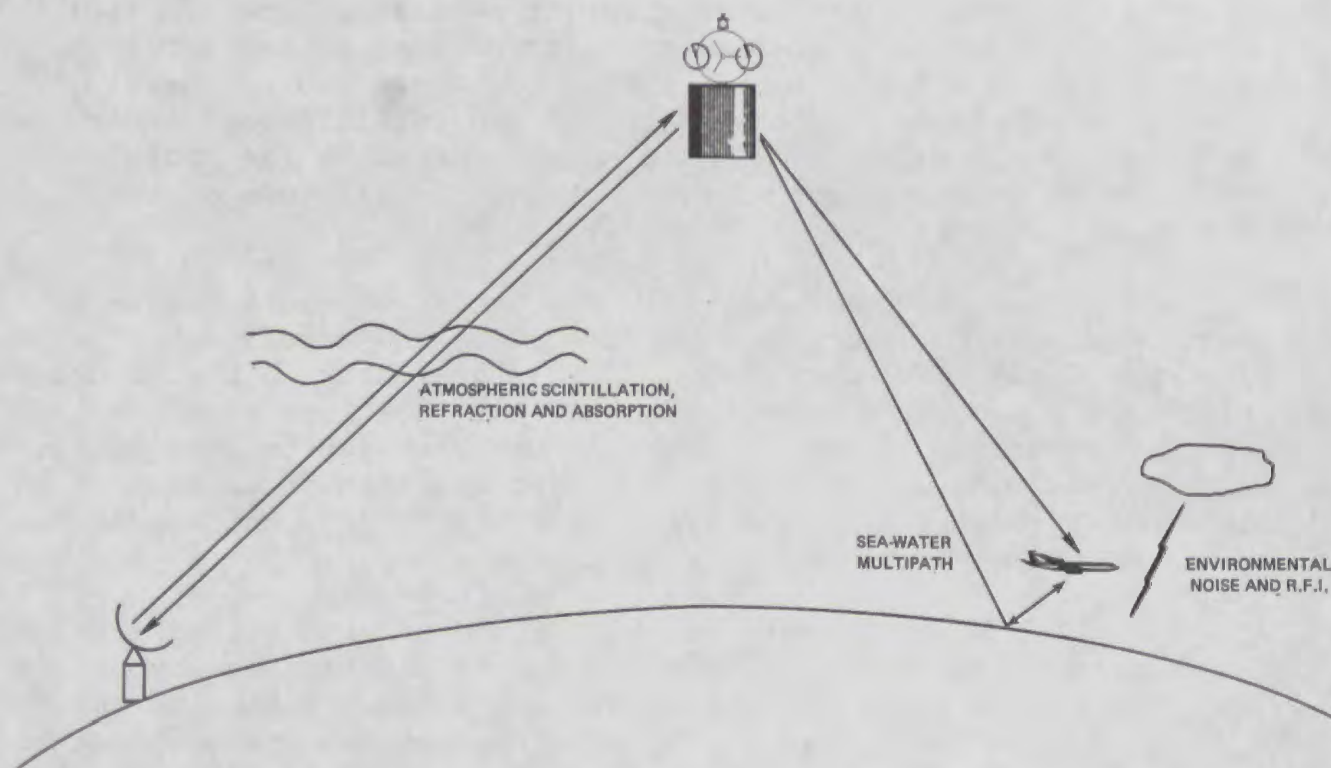
Aircraft Ranging Experiments

Several comprehensive studies have been performed indicating the feasibility of using ranging via satellites to aircraft for determination of aircraft position. The simplest of these techniques would use the intersection of the surfaces of three spheres to establish a position fix. Two of these spheres would have the coordinates of two satellites as their centers. The third sphere would be determined by the radial distance from the center of the earth to the altitude of the aircraft.

In a typical scheme, a ground station would transmit an interrogation signal to an aircraft via one satellite. The aircraft would then transpond a reply signal back to the ground station via two satellites. Assuming the locations of the satellites are known, measurement of the propagation time delays between the interrogation and reply signals identifies the distances from the two satellites to the aircraft, and hence, the aircraft's position.

The ranging tests already conducted with aircraft at VHF have involved only one of several possible ranging techniques and have left a number of unanswered questions. These include choice of the most suitable modulation technique, the best method to resolve range-measurement ambiguities, and achievable ranging accuracies. Experiments, both at VHF and at UHF, are required to evaluate the alternatives.

At least some of the various modulation techniques that have been proposed should be selected for experimental evaluation prior to specifying a particular technique for a fully operational system. Proposed techniques include Tone Burst Code, Fixed CW Tone Pack, BINOR Code, Pseudo-Noise (PN) coding and Frequency Sweep (Chirp). The latter three approaches may prove to be more applicable at UHF, since they are inherently broadband techniques.



PROPAGATION AND NOISE TESTS

G-5872

Propagation and Noise Tests

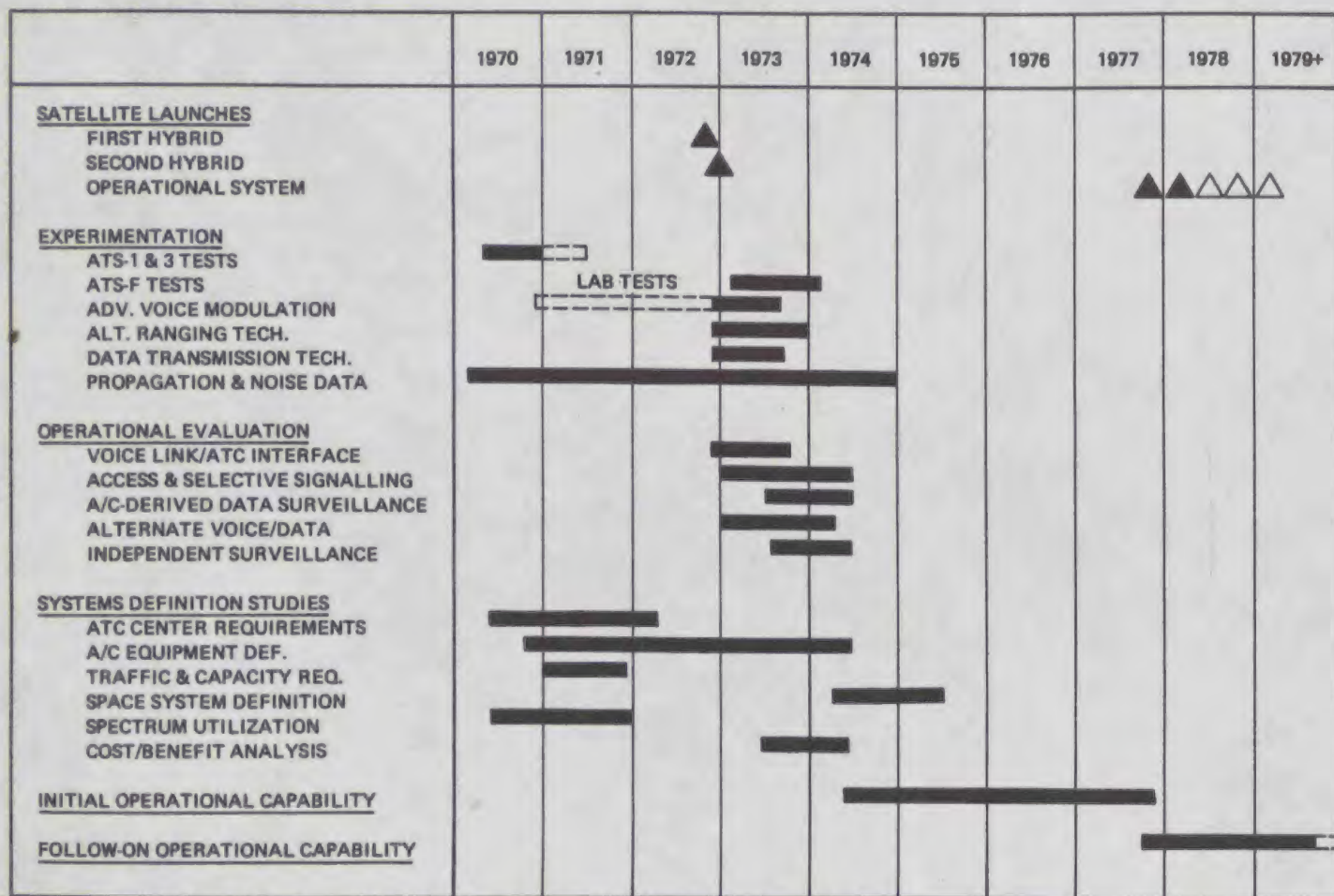
A number of programs of propagation and noise evaluation should be accomplished before establishing the parameters of a fully operational aeronautical satellite system. Due to the limited directivity of aircraft antennas, the effects of reflections of satellite signals from the surface of the earth will be of significance in both the VHF and UHF bands. Of the various atmospheric effects, those produced by the ionosphere will be particularly important in systems using the VHF frequencies. Finally, in order to determine the practical operational limits on system performance, additional experience is required on the effects of environmental noise and radio frequency interference at aircraft receivers.

Ionospheric effects are best determined by observations made from ground stations. Such test programs have been under way for some time and should be continued prior to and independent of the launch schedule for aeronautical satellites. A comparative evaluation of the practical implications of these effects at VHF and UHF in an operating system can be determined using the combined VHF and UHF services proposed.

The geographic dependence of ionospheric effects is an important factor in the assessment of the utility of the VHF band for services in a fully operational satellite system. Experience to date indicates a sharp geographic dependence of the more significant ionospheric effects. The practical operational implications of these effects over the most important route structures can be determined with a combined VHF/UHF test program in both the Pacific and Atlantic Ocean areas.

III.8

LONG RANGE PROGRAM PLAN



LONG RANGE PROGRAM PLAN

Long Range Plan

A number of system studies, laboratory and space experiments, and operational tests are required in advance of the definition of a fully operational aeronautical satellite system. The plan outlined here calls for an early start for supporting studies and laboratory tests and assumes continuation of the ATS experimental program.

A single hybrid satellite in orbit would make possible some of the necessary space experimentation and operational evaluation in the 1972-74 time period. Tests of two-satellite ranging using both the VHF and UHF bands could be accomplished by using two hybrid satellites as shown in Section III.2.

It is assumed that definition of a second generation system could be achieved in the 1974-75 time period with initial deployment on a fully operational basis beginning by the end of 1977. The number of second generation operational satellites for Atlantic and Pacific services is assumed to be between two and five, depending upon decisions regarding the need for two-satellite position determination and in-orbit spares. It is conceivable that initial required spare capacity might be available as a residual capability of the first generation hybrid satellites.

After an intensive test and evaluation program through mid-1974, the hybrid satellite would provide an initial operational capability until deployment of the second generation system.

Comsat

Wednesday 5/13/70

9:40 William J. Bivens, Navy Captain (Retired), called at the suggestion of Mr. Flanigan's office. He is a constituent of Congressman Broyhill who supported him when Mr. Meany was reappointed to the Comsat Board of Directors.

Would like to talk with you.

Address: 7710 Briston Drive
Annandale, Virginia

256-5312

THEY TALKED

Tuesday 5/12/70

5:00

Mr. Flemming's Office called back. They said the clearance has not yet started on Peterson.

Al
Flemming

Malise
Blank
X 2523
cc

Comsat

THE WHITE HOUSE

WASHINGTON

May 1, 1970

MEMORANDUM FOR TOM WHITEHEAD

FROM: PETER FLANIGAN

pmf

We have just made two appointments to COMSAT and I am not aware of any current vacancies but would like to have this brought to my attention if there are any future vacancies coming up.

Pete

5/5/70

Only one per year.

*This year it was Ruth Peterson
(vice Haggerty)*

*Next year we will replace
Fred Donner who wants to retire.*

T

MEMORANDUM

THE WHITE HOUSE
WASHINGTON

April 29, 1970

TO PETER FLANIGAN
FROM HARRY FLEMMING *hbf*

Fred Ford who was Chairman of the FCC during the Eisenhower Administration and a close friend of mine, suggested that in considering the upcoming vacancy on the FCC, that thought be given to appointment of an engineer to that position. His logic is that no one on the board at the present time has that type of background. Apparently no engineer has been appointed since Eisenhower did in the 1950s. Fred feels that the engineer member was an invaluable aid to them.

It is certainly worthy of consideration.

100-100000-1000
RECEIVED

MEMORANDUM

THE WHITE HOUSE
WASHINGTON

April 29, 1970

TO PETER FLANIGAN

FROM HARRY FLEMMING *HF*

Fred Ford who was Chairman of the FCC during the Eisenhower Administration and a loyal working Republican, would like to be considered for the next vacancy on COMSAT.

What are the prospects?

VS31 JUN 13
RECEIVED

VS31 JUN 13
RECEIVED

Mr. Whitehead
See page 3

(Draft for Consideration of the Comsat Board of Directors)

STATEMENT AND EXPLANATION OF POLICY GOVERNING
PARTICIPATION OF THE UNITED STATES DELEGATION
IN THE WORK OF THE INTERSESSIONAL WORKING
GROUP (IWG) AS ESTABLISHED BY THE RESUMED
PLENIPOTENTIARY CONFERENCE ON DEFINITIVE
ARRANGEMENTS FOR THE INTERNATIONAL
TELECOMMUNICATIONS SATELLITE CONSORTIUM

PMJ

1. Objective of U.S. participation in the work of the IWG.

Building upon the significant progress already made in the INTELSAT Plenipotentiary Conference through the effort of all participants, the U.S. delegation seeks to achieve recommended texts of agreements for the definitive arrangements that can be approved by at least two-thirds of the participants in the next resumed Plenipotentiary Conference and that can be signed by governments and signatories, including the U.S. Government and Comsat, representing at least two-thirds of the investment shares.

2. Required conditions for the U.S. to meet such objective.

(a) The U.S. delegation must affirm and hold fast to its position, apparently shared by most participants, that the commercial effectiveness of INTELSAT be maintained and protected, consonant with the national interest of the U.S. and the corporate responsibilities of Comsat as well as with the interests and responsibilities of communications entities the world over. Accordingly, the U.S. delegation must exercise caution that no proposals are recommended by the IWG in language--even though it is literally derived from documents that come within the terms of reference to the IWG--which allows an interpretation contrary to the fundamental U.S. position.

(b) This point is particularly applicable to language involving the functions of the Secretary General as they might bear on technical and operational management of the INTELSAT commercial system and to language involving powers of the organs in which two-thirds of the Signatories or Parties, respectively, may act or one-third plus one may prevent action.

(c) The concern expressed here requires clear language that there is to be no interposition by the Secretary General between the Board of Governors and Comsat as technical and operational manager under contract during the transitional period or between

Comsat and its subcontractors. It also requires putting the respective powers of the Board of Governors, the Meeting of Signatories, and the Assembly of Parties into action-tight separate compartments that allow no interference with, nor any cause for delay of, actions within the proper responsibility of the Board of Governors.

3. The nature of Comsat as the only U.S. source of investment in INTELSAT.

(a) Communications Satellite Corporation, otherwise known as Comsat, was authorized to be created by Public Law 87-624 of the U.S. Congress (the "Communications Satellite Act of 1962") as a private corporation for profit which is not an agency or establishment of the U.S. Government. See Sec. 301.

(b) Under the law it is the only U.S. entity authorized to "plan, initiate, construct, own, manage, and operate itself or in conjunction with foreign governments or business entities a commercial communications satellite system." See Sec. 305(a) (1). As such it is common communications carrier and subject to having its investment, service, and pricing practices regulated by the U.S. Federal Communications Commission (FCC). See Sec. 401 and the Communications Act of 1934.

(c) Comsat is entirely financed through capital stock which has been sold to other domestic business entities and personal investors and is now held by over 135,000 shareholders.

(d) Comsat has a present net investment from its capital funds of \$69 million in INTELSAT and anticipates that within five more years its net investment will be over \$105 million.

4. Legal restraints upon Comsat against agreeing to have powers over its investment in INTELSAT assigned to governments or to other business entities.

(a) The Board of Directors of Comsat is legally bound to conform to the Communications Satellite Act by which the corporation was authorized to be established, and it is legally obligated to the corporation's shareholders to exercise prudent business judgment in the investment of its funds and in delegation of powers over such investments.

(b) The Communications Satellite Act directs and authorizes Comsat to develop, invest in, manage, and operate a commercial communications satellite system, global in its scope, either by itself or in conjunction with foreign governments or business entities. This authorization requires Comsat to maintain at least a reasonable measure of joint control over each and every one of such functions. Therefore, it cannot agree to have governments or other business entities, operating through organs of INTELSAT, independently exercise control in any substantial degree by a two-thirds vote irrespective of the investments represented in such vote and irrespective of the essential interests of Comsat and other major investors.

(c) The responsibility of the Comsat Board of Directors to the Comsat shareholders precludes the Board from allowing powers over its investment in INTELSAT to be assigned in any substantial degree to one-nation-one-vote organs when the effect of voting procedures therein would allow a two-thirds vote by Signatories or Parties representing only 11.79% of the investment shares to take action and would allow a vote of one-third plus one, which could reflect only 1.57% of the investment shares to prevent action.* The only delegation justifiable under U.S. domestic law of a corporation's powers over capital investments in joint ventures with other entities is one that relates to proportionate investment shares, as is contemplated in the proposed voting procedures for the Board of Governors to which Comsat is agreeable.

5. Effect of such restraints upon the legal authority of the U.S. Government to enter into an INTELSAT intergovernmental agreement.

(a) The present agreement establishing interim arrangements for INTELSAT, Art. II (a), provides, and the definitive arrangements will probably likewise provide, that the relations between each government and its designated communications entity "shall be governed by the applicable domestic law."

* These percentages are derived from the 1971 projected year end relative usage of the system by all 75 INTELSAT members but with credit for usage up to the minimum individual investment presently required.

(b) Relations between the U.S. Government and Comsat are governed by the Communications Satellite Act of 1962. Under that law authority of the U.S. Government over arrangements to be made with foreign governments or entities as they involve or affect Comsat is limited to assuring that they "shall be consistent with the national interest and foreign policy of the United States." See Sec. 201(4) and Sec. 402.

(c) Any agreement between the U.S. and other governments which would have the effect of changing Comsat's powers and responsibilities under the law by which it is authorized to invest in INTELSAT would require either the consent of the U.S. Senate for a treaty which overrides the domestic law or an amendment by Congress of the Communications Satellite Act.

(d) As a result it must be the policy of the U.S. Government under its present legal authority to oppose language for the definitive INTELSAT arrangements being negotiated which would give powers over the development, operation, and management of commercial satellite communications system to organs of governments or their designated entities capable of acting without regard to the investment shares involved.

6. Compatibility of the U.S. policy with the interests and authority of other governments and communications entities.

(a) Claim that the sovereignty of nations requires the Assembly of Parties to be the premier organ of the consortium with policy-determining functions and residual powers overlooks the effect of proposed voting procedures within the Assembly. The effect of such procedures is not to preserve the sovereignty of each nation, if that is even a relevant consideration for arrangements of this type, but to remove authority from each national party to the arrangements and place it in a limited combination of two-thirds the number of parties which would have the power to act and of one-third plus one which would have the power to prevent action.

(b) Whatever rights must be left to individual nations as sovereign powers are to be assured not by giving rights of this sort to an Assembly of Parties but by recognizing that each nation retains the right to refrain from signing the definitive arrangements as adopted by the Plenipotentiary Conference and the right at any time to withdraw from participation.

(c) The interests of all governments and their respective communications entities are best served for the commercial purposes of INTELSAT by a plan that relates the authority over development, operations, and management to investment shares because investment shares reflect the respective levels of need for, and degrees of dependency on, the communications system provided.

(d) Each of seventy-five nations has found it in its interest and within its authority to become a party to the present arrangements, notwithstanding that such arrangements do not include an Assembly of Parties.

Cmsat

May 7, 1970

Dear Miss Cullen:

Peter Flanigan has asked that I reply to your letter of April 9th regarding Comsat. Although there is no White House study of Comsat, we are well aware of the importance of the small stockholder in Comsat. You can be assured that we are doing everything we can to make Comsat's job easier of providing global satellite communications. We have also recommended to the Federal Communications Commission that Comsat be allowed to compete in the domestic area should the Comsat Board of Directors decide that would be in the best interests of Comsat.

Thank you for your interest.

Sincerely,

Clay T. Whitehead
Special Assistant to the President

Miss Virginia Cullen
943 North Parkside Avenue
Chicago, Illinois 60651

cc: Mr. Flanigan
Mr. Whitehead
Central Files

CTWhitehead:jm

THE WHITE HOUSE
WASHINGTON

4/17/70
(Date)

TO:

Tom Whitehead

FROM:

PETER FLANIGAN

ACTION:

DUE DATE: _____

☒ Prepare reply for
Mr. Flanigan's signature

☐ Direct reply

☐ Comments/recommendations

☒ Please handle

☐ Information

☐ File

REMARKS:

TW

April 9-1970

Dear Mr Flanigan:

In your next meeting on the White House study of Comsat, you might take into conference, that the 97.6% of the stock holders with less than 100 shares were the dopes who put their money in. When all the stock pros. said no it was "pie in the sky" They are the people who made this complex problem possible. Now the pie is on the table and the usual how much can we make. and who gets the big paying jobs is the grind. So lets stop

playing politics national and
big business. And sit down and
just get one thing done.

One of the days.

Virginia Cullen
943 N. Parkside Ave.
Chicago, Ill. 60651



Comsat

COMMUNICATIONS SATELLITE CORPORATION
950 L'ENFANT PLAZA, SW WASHINGTON, D.C. 20024

For Immediate Release
Tuesday, April 28, 1970
No. 70-25

James McCormack announced today that he will not continue as Chairman and Chief Executive Officer of Communications Satellite Corporation, beyond the annual shareholders meeting on May 12. Sometime ago, on his doctor's advice, he had asked the COMSAT Board of Directors to relieve him of his present executive responsibilities. He will continue as a director of COMSAT.

At a special meeting on April 27, the COMSAT Board expressed the intention to elect Joseph H. McConnell, President of Reynolds Metals Company and a member of COMSAT's Board, as Chairman of the Board at its organization meeting following the annual meeting. It is intended that the title Chief Executive Officer will be dropped. Mr. McConnell will continue as President of Reynolds Metals Company.

2. Deferred Charges

Preliminary costs incident to the development of a domestic satellite system and an aeronautical satellite system have been deferred at December 31, 1968 and 1967 in the respective amounts of \$909,000 and \$392,000. The disposition of such deferred items is subject to determination by the Federal Communications Commission. Pre-operating expenses for earth stations while under construction have also been deferred for amortization by a reverse sum-of-the-years digits method over a period of three years from the dates the earth stations are placed in service. The unamortized balances at December 31, 1968 and 1967 were \$833,000 and \$92,000, respectively.

3. Income Taxes

Satellite system development costs, research and development costs and certain other expenditures that are capitalized or deferred for accounting purposes have been deducted in determining income subject to tax. On this basis, there is no taxable income for 1968 and prior years. At December 31, 1968, for tax purposes, the Corporation had operating loss carry-forwards of approximately \$7,200,000 expiring in 1971 and 1972. The effect of subsequent benefits that may result from use of these carry-forwards (which are attributable to the aforementioned capitalized or deferred expenditures) would be to increase the accumulated credit for deferred income taxes, rather than to increase net income of years in which the benefits are realized. The Corporation also has unused investment credits of approximately \$1,450,000 expiring principally in 1973 through 1975.

The net charges to income in 1968 and 1967 for deferred Federal income taxes amounted to \$5,655,000 and \$3,363,000, respectively, and were allocated between other income and operating expenses. The accumulated amount of \$18,075,000 deferred at December 31, 1968 will be applied in reduction of income tax expense of subsequent years over which the items that have been capitalized or deferred for accounting purposes are amortized.

The Corporation's Federal income tax returns for the years through 1966 have been examined and accepted by the Internal Revenue Service.

4. Development Programs and Commitments

In conjunction with other members of the International Telecommunications Satellite Consortium and the other earth station owners in common, the Corporation is engaged in developing a global commercial communications satellite system. The Corporation is also engaged in the construction of a research laboratory to be utilized in research and development activities. Substantial expenditures will be required in carrying out the various programs. The Corporation's share of contractual commitments under these programs at December 31, 1968 aggregates approximately \$35,000,000.

The Corporation has leased the major part of an office building, which was occupied beginning in 1968, for a period of five years with an option to extend the lease for an additional five years. Annual rentals under the lease are approximately \$1,170,000. The Corporation also has an option, commencing in mid-1971, to purchase the building for an amount equivalent to its cost (which at this time is estimated at approximately \$10,900,000) plus \$500,000 and to purchase the land on which the building is situated for \$1,375,000.

5. Retirement Plan

The Corporation has a trustee plan for retirement allowances which is non-contributory and covers all regular employees. The actuarially determined current service costs, including the portions borne by other participants, were \$820,000 in 1968 and \$570,000 in 1967; prior service costs were recorded before 1967. The Corporation's policy is to fund all accrued costs of the plan.

6. Rate Investigation

On January 14, 1969 the Corporation filed a motion with the Federal Communications Commission requesting the Commission to terminate its rate investigation instituted in June 1965 and to remove its restrictions on the Corporation's accounting for revenues. By Order of the Commission adopted February 14, 1968 the restrictions had been withdrawn until January 1, 1969 permitting the Corporation to submit its financial reports in 1968 to the public, its stockholders and the Commission in a normal manner. Action on the Corporation's motion and withdrawal of the restrictions on the Corporation's accounting for revenues is still pending with the Federal Communications Commission. The Corporation anticipates an early favorable conclusion to these matters.

Also pending under the above rate investigation is the matter of a rate to be used for interest during construction. Effective May 1, 1967, interest during construction has been recorded at the rate of 7% per annum applied to expenditures for tangible property. This rate may be adjusted upward retroactively to May 1, 1967, assuming favorable action by the Federal Communications Commission.

7. 1967 Operations

Full commercial operations began on May 1, 1967. For the eight months subsequent to that date, operating expenses included all expenses of the Corporation, except those appropriately capitalized or deferred in the normal course of operations. For the four months prior to May 1, 1967, operating expenses (after the transfer of \$2,293,000 to satellite system development costs) represent those associated with the limited satellite operations during that period. For the respective eight-month and four-month periods, operating revenues amounted to \$14,525,000 and \$3,939,000, and net income amounted to \$2,869,000 and \$1,769,000.

Under the provisions of the Communications Satellite Act of 1962, six of the Corporation's Directors are elected by the public shareholders (Series I), six are elected by the communications common carrier shareholders (Series II) and three are appointed by the President of the United States with the advice and consent of the Senate.

At the time the Act was passed it was anticipated that there would be a fifty-fifty division of shares among carriers and the public, which came about in fact when the stock was issued in 1964. The Incorporators of the Corporation made a commitment to Congress to seek an amendment to the Act in the event carrier shareholdings should fall below 45 percent of all outstanding shares.

The subsequent sales to the general public of 950,000 COMSAT shares by International Telephone & Telegraph Corporation and some 240,000 shares by various other carriers qualified to own Series II shares has now decreased carrier holdings to approximately 38 percent of total outstanding shares, with approximately 62 percent being held by the general public.

Thus, the Corporation recommended an amendment to the Satellite Act to keep the representation of the public and the carriers on the COMSAT Board of Directors approximately proportionate to their respective shareholdings. The Congress passed the bill in February 1969.

The new law establishes a formula whereby the number of Directors which the carriers may elect and the number which the public shareholders may elect is fixed, as of the record date for each Annual Shareholders Meeting, so that at each meeting the number of Directors elected respectively by the Series I and Series II shares is approximately proportionate to the total number of shares held by each series. Accordingly, at the 1969 Annual Shareholders Meeting, eight Series I Directors and four Series II Directors will be proposed for election.

Following his designation as Secretary of the Treasury in December 1968, David M. Kennedy, a Series I Director of COMSAT, resigned, effective December 31, 1968. Rudolph A. Peterson, President of The Bank of America, was elected by the Series I Directors to fill the vacancy in February of 1969.

Two Series II (carrier) Directors resigned in 1968, both of them ITT representatives, coincident with progressive sales of COMSAT stock by ITT. Eugene R. Black resigned on June 21 and Ted B. Westfall on December 31. ITT's remaining holding of COMSAT stock is 100,000 shares. There are more than 100 other carriers holding approximately 3,700,000 shares.

Eugene R. Black*

Business Consultant, New York, N. Y. (Series II)

Harold M. Botkin

Assistant Vice President, American Telephone and Telegraph Company, New York, N. Y. (Series II)

Joseph V. Charyk

President, Communications Satellite Corporation, Washington, D. C. (Series I)

James E. Dingman

Business Consultant and former Vice Chairman of the Board, American Telephone and Telegraph Company, New York, N. Y. (Series II)

Frederic G. Donner

Director and former Chairman of the Board, General Motors Corporation, New York, N. Y., and Chairman, Alfred P. Sloan Foundation. (Presidential Appointee)

Douglas S. Guild

President, Hawaiian Telephone Company (a subsidiary of General Telephone & Electronics Corp.), Honolulu, Hawaii (Series II)

William W. Hagerty

President, Drexel Institute of Technology, Philadelphia, Pa. (Presidential Appointee)

David M. Kennedy*

Chairman, Continental Illinois National Bank and Trust Company, Chicago, Ill. (Series I)

George L. Killion

Vice Chairman, Metro-Goldwyn-Mayer, Inc., New York, N. Y. (Series I)

James McCormack

Chairman and Chief Executive Officer, Communications Satellite Corporation, Washington, D. C. (Series I)

George Meany

President, AFL-CIO, Washington, D. C. (Presidential Appointee)

Horace P. Moulton

Vice President and General Counsel, American Telephone and Telegraph Company, New York, N. Y. (Series II)

Rudolph A. Peterson*

President, Bank of America, San Francisco, Calif. (Series I)

Bruce G. Sundlun

Partner, Amram, Hahn & Sundlun (Attorneys), Providence, R. I., and Washington, D. C. (Series I)

Leo D. Welch

Former Chairman and Chief Executive Officer of the Communications Satellite Corporation and Director of other companies, New York, (Series I)

Ted B. Westfall*

Executive Vice President, International Telephone & Telegraph Corporation, New York, N. Y. (Series II)

* For recent changes, see explanation in the column to the left.



*Eugene R. Black (resigned)**



Harold M. Botkin



Joseph V. Charyk



James E. Dingman



Frederic G. Donner



Douglas S. Guild



William W. Hagerty



*David M. Kennedy (resigned)**



George L. Killion



James McCormack



George Meany



Horace P. Moulton



*Rudolph A. Peterson**



Bruce G. Sundlun



Leo D. Welch



*Ted B. Westfall (resigned)**

CORPORATION DATA

*Joseph H. McConnell Chairman
(not Chief Exec Officer)*

Officers and Officials of the Corporation

James McCormack, *Chairman and Chief Executive Officer*
Joseph V. Charyk, *President*
David C. Acheson, *Vice President and General Counsel*
Lucius D. Battle, *Vice President (Corporate Relations)*
John A. Johnson, *Vice President (International)*
A. Bruce Matthews, *Vice President and Treasurer*
Siegfried H. Reiger, *Vice President (Technical)*
George P. Sampson, *Vice President (Operations)*
Bruce S. Lane, * *Secretary and Assistant General Counsel*
Robert B. Schwartz
and Jerome W. Breslow, *Assistant Secretaries and General Attorneys*
Frederic M. Mead, *Comptroller*
Ronald C. Mitchell, *Assistant Comptroller*
Joseph H. Engel, *Director of the Office of Planning Research and Services*
Matthew Gordon, *Director of the Office of Information*
Thomas W. Harrington, *Director of the Office of Personnel*
J. Robert Loftis, *Director of the Office of Organization and Manpower Planning*
Lewis C. Meyer, *Director of the Office of Procurement and Contracting*
Kenneth F. Zitzman, *Director of the Office of INTELSAT Management*

* Mr. Lane was elected to the additional position of Secretary following the resignation of J. David Marks in December 1968.

HEADQUARTERS: The COMSAT Building, 950 L'Enfant Plaza South, S.W., Washington, D.C. 20024

TRANSFER AGENTS: Continental Illinois National Bank and Trust Company of Chicago, Chicago, Illinois
Manufacturers Hanover Trust Company, New York, New York
Wells Fargo Bank, San Francisco, California

REGISTRARS: The First National Bank of Chicago, Chicago, Illinois
The Chase Manhattan Bank, N.A., New York, New York
Bank of America National Trust and Savings Association, San Francisco, California

SHARES TRADED: New York Stock Exchange
Midwest Stock Exchange
Pacific Coast Stock Exchange

ANNUAL MEETING: Tuesday, May 13, 1969; 2:30 P.M.
EDST, L'Enfant Theatre, 429 L'Enfant Plaza Centre, S.W., Washington, D.C. 20024

Shortly before the INTELSAT III launch on December 18, the satellite was in place atop the Long Tank Delta vehicle, reflected in a man-made pond beside the gantry. Seconds before liftoff, a huge spray of water is directed from the pond to the flame deflector beneath the vehicle to minimize damage to the deflector and the gantry. When the engines ignite, much of the spray turns to steam, resulting in the smoke cloud effect commonly seen in launch pictures.

THE WALL STREET JOURNAL
Wednesday, April 29, 1970

McConnell of Reynolds To Replace McCormack As Comsat's Chairman

By a WALL STREET JOURNAL Staff Reporter
WASHINGTON — Directors of Communications Satellite Corp. said they intended to name Joseph H. McConnell, president of Reynolds Metals Co. and a Comsat director, as chairman after the May 12 annual meeting.

The 63-year-old Mr. McConnell will succeed James McCormack as chairman, but the title of chief executive officer, which Mr. Mc-

Cormack also held, will be dropped.

Mr. McCormack, 59 years old, had for health reasons asked to be relieved of his executive responsibilities after Comsat's annual meeting next month. He will remain as a director.

Mr. McConnell, former president of National Broadcasting Co., an RCA Corp. subsidiary, will continue as president of Reynolds Metals, Richmond, Va. It's understood that present arrangements call for Mr. McConnell to serve as Comsat chairman without salary. Mr. McCormack received \$135,000 yearly in his dual role as chairman and chief executive officer.

THE NEW YORK TIMES
Wednesday, April 29, 1970

Chairman and Chief Officer Of Comsat Retiring May 12

WASHINGTON, April 28 (AP) — James McCormack, chairman and chief executive of the Communications Satellite Corporation, announced today he is retiring from those offices at the annual shareholders' meeting on May 12.

Mr. McCormack, 59 years old, is a retired Air Force officer and has headed the corporation since 1965.

The announcement said that on his doctor's advice, McCormack asked the Comsat board of directors some time ago to relieve him of his executive responsibilities. He will continue as a director of the corporation.

The board, at a special meeting yesterday expressed its intention to elect Joseph H. McConnell as chairman when the board meets to organize following the annual meeting. Mr. McConnell, president of the Reynolds Metals Company, at

Richmond, Va., will continue to serve in that post. He is now a member of the Comsat board.

No one is to be designated to succeed Mr. McCormack as chief executive officer. Dr. Joseph V. Charyk continues as president.

THE WASHINGTON POST
Wednesday, April 29, 1970

Comsat Officer Retires; New Head Named

James McCormack, chairman of the board and chief executive officer of the Communications Satellite Corporation (Comsat), plans to retire after the company's annual meeting May 12.

Comsat's Board of Directors

announced that they intended to elect Joseph H. McConnell, president of the Reynolds Metal Company, to fill McCormack's position as chairman of the board.

The title of chief executive officer will be abolished, and Joseph Charyk will continue as the company's president. McConnell, a former president of the National Broadcasting Company, will continue as full-time president of Reynolds.

McCormack, who has headed Comsat since 1965, said he had decided to resign on the advice of his doctors.

COMSAT

WASHINGTON (AP)-JAMES MCCORMACK, CHAIRMAN AND CHIEF EXECUTIVE OFFICER OF THE COMMUNICATIONS SATELLITE CORP., ANNOUNCED TODAY HE IS RETIRING FROM THOSE OFFICES AT THE ANNUAL SHAREHOLDERS' MEETING MAY 12.

MCCORMACK, 59, IS A RETIRED AIR FORCE OFFICER AND HAS HEADED THE CORPORATION SINCE 1965.

THE ANNOUNCEMENT SAID THAT ON HIS DOCTOR'S ADVICE, MCCORMACK ASKED THE COMSAT BOARD OF DIRECTORS SOME TIME AGO TO RELIEVE HIM OF HIS EXECUTIVE RESPONSIBILITIES. HE WILL CONTINUE AS A DIRECTOR OF THE CORPORATION.

THE BOARD, AT A SPECIAL MEETING MONDAY, EXPRESSED ITS INTENTION TO ELECT JOSEPH W. MCCONNELL AS CHAIRMAN WHEN THE BOARD MEETS TO ORGANIZE FOLLOWING THE ANNUAL MEETING. MCCONNELL, PRESIDENT OF THE REYNOLDS METALS CO., AT RICHMOND, VA., WILL CONTINUE TO SERVE IN THAT POST. HE IS NOW A MEMBER OF THE COMSAT BOARD.

NO ONE IS TO BE DESIGNATED TO SUCCEED MCCORMACK AS CHIEF EXECUTIVE OFFICER. DR. JOSEPH V. CHARYK CONTINUES AS PRESIDENT.

PD558PED 4/28

COMMUNICATIONS SATELLITE CORPORATION

MEMORANDUM

ROBERT E. BUTTON
Director of Governmental Relations

April 27, 1970

NOTE TO TOM WHITEHEAD:

Per our conversation.

R.E.B.

Comsat

CORPORATION CONFIDENTIAL

MEMORANDUM OF CONVERSATION

April 24, 1970

... COMSAT/TELEPROMPTER CORPORATION
New York City - April 22, 1970

Messrs. Kahn, Charyk, Button and Mrs. Klein

1. TPT Question: Philosophically speaking, was COMSAT interested in a possible new joint venture using a domestic satellite system to interconnect cable systems into a national broadband service?

COMSAT Answer: Yes. COMSAT saw this as not only a great business potential but as a most appropriate use of satellite technology in the domestic area.

2. TPT envisioned a Thor-Delta-launched not less than 6-channel (possibly up to 8 or 9) initial system with major S/R stations on each coast and possibly four other locations, with an initial base of 1,000 R/O earth stations. COMSAT was thinking of a larger capacity satellite to start, considering the probable rapid growth of demand. TPT, not wanting to put all its eggs into one basket, would rather face the problem of increased demand by adding smaller increments to the system.

3. TPT envisioned participants in a domestic corporation as including itself, COMSAT, an existing network (ABC) and a data concern. The possibility of discussion with all networks was not excluded, but in TPT's estimate the Page network study would get exactly nowhere. As an opening gambit, TPT mentioned 80%-20% equity, with other participants coming out of the TPT 80%, and COMSAT taking 50% of the financing. TPT financing has been favorably discussed with Bank of America and Chase. COMSAT said this kind of financial arrangement was obviously unacceptable.

4. Although TPT stated a readiness to go it alone with Hughes but also with other options as to hardware suppliers, COMSAT's experience, money and prestige were attractive assets. Western Union as an alternative partner was discussed briefly.

CORPORATION CONFIDENTIAL

-2-

5. TPT ability to serve small communities in rural U.S.A. through its AML (20-mile radius omni-directional) was both a political and technical plus. Economically the use of a satellite interconnection would bring an immediate reduction in cost to the rural CATV franchise owner over what he is now paying for microwave importation of the three networks alone, not to mention the added available capacity of the cable system which is now up to 48 channels.

6. TPT hedged on the common-carrier aspects of its plans but COMSAT was talking about a special-purpose (TV distribution) satellite, and reserved on the question of expanding the concept to a regulated common carrier. TPT considered it likely that the early structure of its domestic network contained the seeds of an eventual divestiture action, but it was impossible to say which part of the entity would be more attractive as a result of such action. They would all possess a great potential.

7. It was agreed that COMSAT would respond within two weeks with a counter proposal and with a demonstration that the larger satellite would be a more attractive undertaking.

R.E.B.

Comsat

Friday 4/10/70

5:10 Tom Lias would appreciate a call Monday early
about the possibility of appointment of Tom Reed
to COMSAT. Wanted you to be aware that Reed is
an engineer and he thinks there is a spot available
shortly for an engineer.

2657

OK

done

They talked

Friday 4/3/70

5:30 When I asked Marge who Tom Reed is, she said she wasn't sure but she thought he had worked with Harry Dent when he first started here.

Harry Dent's Office said he is the National Committee man from Calif. He is on Gov. Reagan's staff in charge of all his appointments. He is a millionaire and his father, who lives in Conn., is a multi-millionaire -- mining.

COMMUNICATIONS SATELLITE CORPORATION

JAMES McCORMACK
Chairman

19 March 1970

The Honorable Peter M. Flanigan
Assistant to the President
The White House
Washington, D.C.

Dear Mr. Flanigan:

In a conversation with you and Dr. Whitehead a few weeks ago, I recommended consideration of reappointing President W. W. Hagerty of Drexel University as a Presidential Director of Comsat. Dr. Hagerty, having completed the unexpired portion of the initial term of appointment of President Clark Kerr of the University of California, completes his full tour of appointment in his own right on the date of our next Annual Meeting, 12 May.

Since that conversation, one of our Series I (Public) Directors, Mr. Rudolph A. Peterson, who needs no introduction in the White House, had developed a technical ineligibility to be a Series I Director because of a fortuitous common carrier application.

Because of the intricacies of clearing the eligibility of an individual of diverse interests to be a Series I Director, and because of a severe time limitation, I have persuaded Dr. Hagerty to stand for election as a Series I Director in place of Mr. Peterson. Dr. Hagerty's willingness to do so has saved the most embarrassing possibility of our having to go to the shareholders with a vacancy in our slate, the size of our Board being fixed by the Congress.

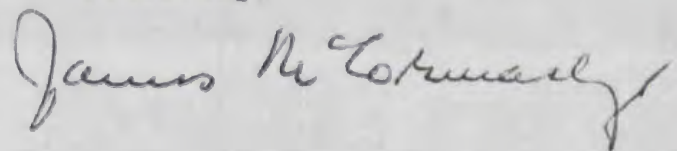
The Honorable Peter M. Flanigan
19 March 1970

To return to Mr. Peterson's case, in briefest terms, after being elected to the Comsat Board he accepted a Directorship of TIME, Inc. This publishing house owns a TV microwave connection in California which they are disposing of but the disposition of which is not yet complete. So long as they own this facility, they are classified as a communications common carrier, a qualification which is apparently significant to the purchaser and which for that reason is being maintained.

Of course TIME in no way competes with, or has interests adverse to, Comsat. Comsat's Articles of Incorporation, however, preclude a Director of a communications common carrier from owning our Public (Series I) shares, and provide further that Series I Directors must be elected from among individuals qualifying to own Series I shares. No such eligibility or condition attaches to a Director appointed by the President.

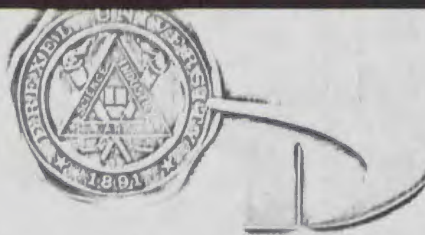
In light of these circumstances, I urge that the President nominate Mr. Peterson as a Director of Comsat, for confirmation by the Senate. In so doing, I would emphasize the importance to this unique endeavor of the continuity of key personnel during the current period when the press and our shareholders are regarding our corporate future as threatened by discontinuity on both the international and domestic fronts.

Sincerely,

A handwritten signature in dark ink, appearing to read "James R. McLaughlin". The signature is fluid and cursive, with a long, sweeping tail on the final letter.

CC: Dr. Clay T. Whitehead

Office of the President



drexel university • philadelphia 19104 • 215-387-2400

March 17, 1970

Mr. Thomas Whitehead
The White House
Washington, D. C.

Dear Mr. Whitehead:

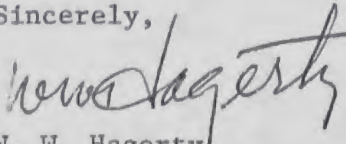
As you know, I have had the honor of serving as a Presidential Director of the Communications Satellite Corporation since August of 1964 and am now approaching the end of my second term. It has been a great honor and distinction for me to have served in this capacity.

From conversations with James McCormack you know that in order to assist in the solution of a Comsat organizational problem, I have agreed to stand for election as a public director at the shareholders' meeting in May this year. Assuming that this plan is agreeable to you, it is my intention to complete my term up to the day of the shareholders' meeting and at that time I plan to write to the President of the United States a letter to indicate the end of my service and my appreciation for the opportunity to serve as a public director. In the meantime, I understand that you would be arranging to recommend some other person for the President's consideration.

If all this is not in full accord with your understanding and agreement, I hope you will write to me immediately.

I enjoyed talking with you the other day. If the proposed plan is consummated, I would still hope to talk with you from time to time, even though I would not be serving as a Presidential Director.

Sincerely,


W. W. Hagerty

dbm

cc: Mr. McCormack

Consat

April 9, 1970

MEMORANDUM FOR HARRY DENT
HARRY FLEMING
TOM WHITEHEAD ✓

FROM: PETER FLANIGAN

Regarding Consat, Rudy Peterson is apparently an effective director, as is Haggerty. Also, both of them are supporters of the President. Therefore, it would seem impossible to remove Peterson as the Presidential Director in favor of Tom Reed. You will remember we were going to try for the Financial Structures Committee, but this cannot be worked out. Unless I hear to the contrary from you by Tuesday, April 14, we will move ahead with Haggerty and Peterson.

MEMORANDUM

THE WHITE HOUSE

WASHINGTON

March 31, 1970

MEMORANDUM TO TOM WHITEHEAD

FROM: Peter M. Flanigan *pmf*

Regarding the attached correspondence from James McCormack concerning Directors to COMSAT, I wondered if your recent conversations with me about McCormack's own future change your recommendations.

I also wonder if there is some way we could get Tom Reed, close to Governor Reagan and a ~~competent~~ fellow, on this board. Apparently Reed wants it. I would appreciate your reviewing this during the week I'm away and bringing it up for a discussion with me immediately on my return. You might also wish to call McCormack and say I'm away but that we will try to have an answer for him by the end of the week of April 6th.

IntelSat
Comsat ✓

Monday 3/23/70

10:25 Abbott Washburn said that when he told you he was having lunch with Jim McCormack Saturday, you asked him to find out what McCormack's plans were for staying on as Chairman of COMSAT.

Mr. Washburn said he didn't have to pry because he volunteered at least this much information. He has had some disc problem with his back and contemplated having an operation on that. However, he may not have to have it. He has trouble with that -- which keeps him awake nights. Also has a hiatus hernia and the combination is apparently messing up his sleep pattern. He has been wanting to get out from under the pressure of the chairmanship. He promised his Board of Directors that he would stay through this plenary that is just finished. He doubts that they'll take any action at any of the upcoming Board meetings except that he's going to tell them again that he wants the burden eased a bit. Mr. Washburn didn't press him since he didn't want to be prying. It sounded as if he might be talking of another job that might be easier or he wanted to get out and get on pension. He couldn't tell. Mr. Washburn told him he hoped he would stay through until the end of the INTELSTAT negotiations; told him he needed him. Mr. Washburn indicates that John Johnson is impossible. The only way he's been able to do anything with the company, is with McCormack. Said with Johnson he can do nothing with the foreigners because they hate him. Mr. Washburn says he would like to see Jim around here until we get through this negotiation. When Mr. Washburn said that, he (McCormack) said something about the stockholders' meeting this year and didn't know whether or not the Board would want action taken at that time. Stockholders' meeting is in the late spring or early summer. There was some question last year about whether he was going to step down then but he didn't. From the way it sounded, he said he would have to alert them again that he needed to get out from under the burden. He (Washburn) said you asked Governor's Scranton's whereabouts with respect to this problem. Washburn will be talking to the Governor today. Would you like the Governor to call you?

The trip to Vietnam is scheduled for April 3-20. Governor will be on part of it -- he thinks probably from the 8th to the 20th.

March 27, 1970

Dear Mr. Gilmour:

The President has asked that I reply to your letter of March 4 regarding the recent White House policy recommendations with respect to domestic communications satellite policy.

It is important to recognize that the Communications Satellite Corporation was created to establish a global communications satellite system. This has been achieved most ably by COMSAT and the system continues to grow. We do not propose any competition with COMSAT in this area.

Our recommendations for domestic satellite services were designed to encourage a healthy industry structure for the extension of satellite communications into our domestic communications industry, and we concluded that COMSAT should also be allowed to participate in this area.

We are pleased to have your views on this matter and appreciate your interest.

Sincerely,

Clay T. Whitehead
Special Assistant
to the President

Mr. Bryant F. Gilmour
B. F. Gilmour Co., Inc.
152 Forty-First Street
Brooklyn, New York 11232

cc: Mr. Whitehead
Central Files

CTWhitehead:jdr/ed



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PIPE WAREHOUSE

BUSH TERMINAL BUILDING No. 20
Area 212 - 785-0700

March 4, 1970

The Honorable Richard M. Nixon, President
White House
Washington, D.C.

Dear Sir:

Several weeks ago you announced that there should be competition, in your opinion, with the Communication Satellite Corp. known as Comsat. When this corporation was formed, it was understood that considering the research and the amount of money involved, that others would not be admitted to compete with Comsat.

Investors took a speculative risk and bought all of the stock that was offered. Two members of my family have a small amount. I do not see how you can retroactively change the game. This is very much like what happened to me when at one time life insurance was free in one's estate but gradually this was brought down to a point where people who took out that life insurance and paid for it over a period of years actually would have been better off in other investments. This is not honest treatment.

Yours very truly,

Bryant F. Gilmour

BFG:mb

COMMUNICATIONS SATELLITE CORPORATION

MEMORANDUM

ROBERT E. BUTTON
Director of Governmental Relations

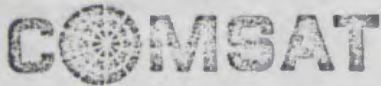
March 25, 1970

NOTE TO CLAY WHITEHEAD:

For your information.

R.E.B.

Attachment



COMMUNICATIONS SATELLITE CORPORATION

JOSEPH V. CHARYK
President

March 25, 1970

Honorable Dean Burch
Chairman
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20554

Dear Mr. Chairman:

The Commission's policy statement issued yesterday appears generally to support our own long-held conviction that satellite communications offer significant benefits for domestic services.

The Report and Order and Notice of Rule Making sets out many fundamental technical, legal, economic and policy issues.

The Communications Satellite Corporation wishes to be fully responsive to the Commission, and is giving careful consideration in its response to these complex issues. In this light, COMSAT hereby notifies the Commission that it intends to file a comprehensive application to provide domestic satellite services as soon as possible.

Sincerely,

SIGNED

Joseph V. Charyk

correct

March 23, 1978

MEMORANDUM FOR PETER FLANIGAN

The attached correspondence from Jim McCannack and Bill Hagerty discuss a problem COMSAT has in filling out their slate of Directors for the shareholders' meeting this May. Because of a technicality, Mr. Rudolph A. Petersen, one of the Public Directors of the Corporation, is no longer eligible to be a Public Director. Jim McCannack recommends, therefore, that Hagerty stand for election as a Public Director and that Petersen be named a Presidential Director vice Dr. Hagerty.

It has been traditional for there to be one Public Director from academia, labor, and industry. There is, however, no particular rationale for this, and I doubt that we would generate any criticism. Jim McCannack sees no possibility of the Administration being embarrassed in this switch of Hagerty and Petersen.

For your information, Rudolph Petersen, the "Industry" Presidential Director, will not be a candidate for reappointment when his term expires next year and he has raised the question of whether or not he should continue his current term because he is no longer actively engaged in the business community. We therefore could replace an academic Director if we chose next year.

I therefore recommend that we nominate Mr. Petersen to be a Presidential Director.

Clay T. Whithead
Special Assistant
to the President

Attachments

cc: Mr. Whithead
Central Files

CTWhithead:ed

COMMUNICATIONS SATELLITE CORPORATION

JAMES McCORMACK
Chairman

19 March 1970

The Honorable Peter M. Flanigan
Assistant to the President
The White House
Washington, D.C.

Dear Mr. Flanigan:

In a conversation with you and Dr. Whitehead a few weeks ago, I recommended consideration of reappointing President W. W. Hagerty of Drexel University as a Presidential Director of Comsat. Dr. Hagerty, having completed the unexpired portion of the initial term of appointment of President Clark Kerr of the University of California, completes his full tour of appointment in his own right on the date of our next Annual Meeting, 12 May.

Since that conversation, one of our Series I (Public) Directors, Mr. Rudolph A. Peterson, who needs no introduction in the White House, had developed a technical ineligibility to be a Series I Director because of a fortuitous common carrier application.

Because of the intricacies of clearing the eligibility of an individual of diverse interests to be a Series I Director, and because of a severe time limitation, I have persuaded Dr. Hagerty to stand for election as a Series I Director in place of Mr. Peterson. Dr. Hagerty's willingness to do so has saved the most embarrassing possibility of our having to go to the shareholders with a vacancy in our slate, the size of our Board being fixed by the Congress.

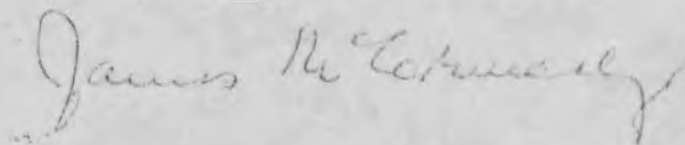
The Honorable Peter M. Flanigan
19 March 1970

To return to Mr. Peterson's case, in briefest terms, after being elected to the Comsat Board he accepted a Directorship of TIME, Inc. This publishing house owns a TV microwave connection in California which they are disposing of but the disposition of which is not yet complete. So long as they own this facility, they are classified as a communications common carrier, a qualification which is apparently significant to the purchaser and which for that reason is being maintained.

Of course TIME in no way competes with, or has interests adverse to, Comsat. Comsat's Articles of Incorporation, however, preclude a Director of a communications common carrier from owning our Public (Series I) shares, and provide further that Series I Directors must be elected from among individuals qualifying to own Series I shares. No such eligibility or condition attaches to a Director appointed by the President.

In light of these circumstances, I urge that the President nominate Mr. Peterson as a Director of Comsat, for confirmation by the Senate. In so doing, I would emphasize the importance to this unique endeavor of the continuity of key personnel during the current period when the press and our shareholders are regarding our corporate future as threatened by discontinuity on both the international and domestic fronts.

Sincerely,

A handwritten signature in cursive script, appearing to read "James M. McInerney".

CC: Dr. Clay T. Whitehead

Office of the President



drexel university · philadelphia 19104 · 215-387-2400

March 17, 1970

Mr. Thomas Whitehead
The White House
Washington, D. C.

Dear Mr. Whitehead:

As you know, I have had the honor of serving as a Presidential Director of the Communications Satellite Corporation since August of 1964 and am now approaching the end of my second term. It has been a great honor and distinction for me to have served in this capacity.

From conversations with James McCormack you know that in order to assist in the solution of a Comsat organizational problem, I have agreed to stand for election as a public director at the shareholders' meeting in May this year. Assuming that this plan is agreeable to you, it is my intention to complete my term up to the day of the shareholders' meeting and at that time I plan to write to the President of the United States a letter to indicate the end of my service and my appreciation for the opportunity to serve as a public director. In the meantime, I understand that you would be arranging to recommend some other person for the President's consideration.

If all this is not in full accord with your understanding and agreement, I hope you will write to me immediately.

I enjoyed talking with you the other day. If the proposed plan is consummated, I would still hope to talk with you from time to time, even though I would not be serving as a Presidential Director.

Sincerely,

W. W. Hagerty

W. W. Hagerty

dbm

cc: Mr. McCormack

Comsat

March 16, 1970

Dear Mr. Saunders:

The President has asked that I reply to your letter of February 23rd regarding the Communications Satellite Corporation.

We share your assessment that the performance of COMSAT has been outstanding. COMSAT has indeed had invaluable operating experience and resources to enter the domestic satellite area. The White House staff memorandum to the FCC regarding domestic communications satellite policy is in no way unfavorable to COMSAT, but rather opens the way for COMSAT, as well as others, to initiate domestic satellite services when economically and operationally feasible.

Sincerely,

Clay T. Whitehead
Special Assistant
to the President

Mr. James B. Saunders
Standard International Corporation
Andover, Massachusetts 01810

cc: Mr. Flanigan
Mr. Whitehead ✓
Central Files

CTWhitehead:ed



STANDARD INTERNATIONAL CORPORATION

ANDOVER, MASSACHUSETTS 01810 • TELEPHONE (617) 475-5220

February 23, 1970

President Richard M. Nixon
The White House
Washington, District of Columbia

Dear President Nixon:

As a stockholder of Comsat, I am understandably chagrined at the precipitous decline of this stock. I gather that this decline has been the result of an unfavorable (to Comsat) White House staff memorandum to the Federal Communications Commission.

H
I believe that the concept under which Comsat was formed in 1963 was a unique experiment in closer business-government relations which has been, in my opinion, quite successful. This concept has been proposed in other areas such as the postal service, home building, etc. However, unless the concept is supported strongly and implemented, investors could become reluctant to invest in future "Comsat-like" offerings.

Comsat has gained invaluable operating experience. It has displayed a willingness to invest in advanced technology through research and development. It has vast, unused money from the initial offering, way back in 1963, which is not being utilized in the furtherance of original goals but which is sitting in banks, earning interest.

There is too much at stake, it seems to me, to experiment with a multitude of competing firms which think they can provide this system when you can turn to a company like Comsat which has a proven track record and has the resources to implement a domestic communications satellite system now.

Sincerely,

James B. Saunders
James B. Saunders

JBS/ph

Comsat

March 16, 1970

Dear Mr. Feinstein:

Thank you for your letter of February 24th regarding the Communications Satellite Corporation and the international communications industry.

I very much appreciate receiving your views on this important matter and assure you they will be given full consideration.

Sincerely,

Clay T. Whitehead
Special Assistant
to the President

Mr. Harry George Feinstein
126 West End Avenue
Brooklyn, New York 11235

cc: Mr. Whitehead ✓
Central Files

CTWhitehead:ed

February 24, 1970

Dear Mr. Whitehead:

Harry George Farnham

Reference your reply of 2/19/70 to my letter of 1/26/70 addressed to Mr. Peter Flanigan. I am lead to believe that perhaps Dr. Burns, who knows something of my ideas forwarded my letter to you or that you did in fact check my communications to the FCC under file #9540 on satellite communications and that perhaps you checked with Senator Pastore's communications counsel Nicholas Zapple for additional thoughts on the same subject.

If you did check any of these files, then you have seen proofs of originality for all of the "comsats" that have come to public attention to date including one or two that haven't as yet. I'm hoping that even though I'm a layman, that you'll pay close attention to what I write here, though some of it is in the referred to file.

My basic contention is that the Presidential appointed directors in Comsat have already established a dangerous precedent. I circulated all of the "comsats" that you've heard about to point up that point of view. The ideas in the enclosed published reprint were intended to be among other things, a means of greatly enhancing the profit potentials of communications satellites. I almost brought it into existence too and the Justice Dept's. Anti Trust Section can vouch for that. Just check with Mr. Fugate there. Instead I killed it and circulated the ideas in the article to indicate that there were to be hundreds or thousands of such entities in this one field alone, each perhaps requiring Presidential appointed directors.

I spent six years circulating the idea as a means of financing all space research. New means of communications were to be one tiny aspect of that idea. RCA got it and used it as a means of competing with AT&T for project "Advent." General Electric, to whom I had sent it a couple of months earlier came out with an international consortium in its bid to take away communications satellites from AT&T and R.C.A., G.T. & E., and Lockheed's original proposal. "Right off the bat," you had three consortia, each willing to risk their own money in launching their own communication satellites. There were others too, such as forty electronic firms that wanted to band together to finance their own system too as reported in News week at the time. (I have every clipping on Comsat since it hit the press on March 2, 1961 that appeared in the New York press, including other ideas that would lead to "comsats" from before that date, until a couple of years ago.) This is at least four potential communications satellite carriers willing to risk their own money without government help. Each would have provided competition to the other and if one of them went broke, another could have taken his place, if there was enough room on the spectrum. The really important point was, was there enough spectrum for two competing systems or more and was anyone willing to finance them. The former is evident by the fact that many nations are now contemplating launching their own satellites and the latter by the number of companies that tried to get into Comsat and were denied because they were not international communications carriers, this despite the fact that some of these carriers did have some small overseas operations. Had there been four or more competing communications satellite "comsats" there would have been no need for Presidential appointed directors and I would not have spent nine years trying to alert the banking industry and others to the dangers I foresaw.

Instead I would have proceeded to give out more details on how to make these "comsats" operative and you would have supposed that it all evolved

so naturally. Many of the problems besetting this nation now would never have even occurred. Instead I have the bitter satisfaction of knowing that the brightest minds in the world could not unravel any facet of this concept to reality so that it would do a fraction of the good that is its potential. On the other hand, if anyone had given me a hand with any facet of this concept, they would have profited from it, for that should have been their only motivation. Then many of the problems that such a concept could resolve would not be so pressing now.

Had there been at least four satellite consortia for communications, each would have picked the best partners that they could abroad from private enterprise and taken the government out of the telephone communications business abroad or perhaps AT&T would have continued to do business with the British Post Office, but someone else might have made contacts that would ripen now when the government of England wants to get out of the communications business. When some of the nations are industrialized as in the published reprint, the need for communications will greatly expand. There will be a need for more than a dozen consortia, perhaps far more than that. When an innovation came about as in the potential of using a laser in the radioactive frequencies, these companies could quickly change over to it, which Comsat could not. Instead you would find that the members of Intelsat desert and leave the satellites to Comsat, which in the plain vernacular is commonly known as "holding the bag."

As the profit potentials of communications satellite come closer to reality, every member capable of launching satellites and that is four nations to date, plus those that we would help as in Canada, would launch their own system and desert Intelsat. Just what would our position be then?

We would just be plain out of luck and our advantage in communications would be lost, unless we start doing something about it now. We have already lost the capability of selling ground stations to every country because we were "do-gooders." The French have made inroads in Europe and elsewhere with their color scanning system for tv, RCA has been cheated together with the American people in spreading this one color scanning system throughout the globe. (RCA's) The only thing we can do is to let international communications satellites be used as cable is. Any company that wants to put them up between one or more countries should be allowed to do so. Then we may yet have the advantage of spreading our color scanning system to most of the developing world before the French can do anything about it. We can force them to use our scanning system just as NBC virtually forced every channel to program color tv here at home.

The cost of satellites for communications is considered high, that is now, but in relation to the profit potential and the number of participants who can see different uses for one and share the cost, it can be as reasonable as cable, more so. All that would be required is interconnection between satellite systems as in cable.

This letter is directed toward the end that you study the feasibility of competition in international communications and the elimination of Presidential appointed directors, lest you cause the trend to spread all over the earth.

I've spent nine years worrying what this concept will do to my grandchildren and yours too. I haven't much money, but I've put much of what I could spare and much of my time and thinking, even to the neglect of my family, to get someone in a position to do something about it to understand what such a concept could do to our way of life. This antidote to Marx and Lenin is also a superior means of achieving their ends.

I used to be happy giving ideas away, now I don't anymore unless it is in the National interest, as in an idea I gave to Dr. Burns on stabilizing our economy. I noted with interest that Israel suggested something similar more recently, as in the giving of partial wages in the form of bonds. A few weeks ago I gave GT&E an idea on a sonic means of killing barnacles, they haven't acknowledged it as yet and perhaps they won't, but I don't care. If it works, it'll release funds for other research and save millions of dollars in cleaning the bottoms of naval ships etc. But Comsat made me worry about my responsibility in being involved even if nobody knew about it and even if I can prove that it wasn't my idea. (Oh yes I have official proof that it wasn't my idea too.)

It is hoped that you will seriously consider these views. They induced the Wall Street Journal to do an editorial favoring your memorandum. They also told me that they would publish my letter broaching these views but it has not appeared in the press to date.

Sincerely yours,

Harry George Feinstein
126 West End Avenue
Bklyn, N.Y. 11235

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

HOW PRIVATE ENTERPRISE CAN PROFITABLY BURY COMMUNISM

By HARRY GEORGE FEINSTEIN

(Special To Brandon's SHIPPER & FORWARDER)

Mr. Feinstein does not pretend to have developed a complete theory; for example, he leaves the question of overproduction unanswered, nevertheless we publish this article as an interesting abstract idea. Written comments are invited. — Editor.

IF WE would greatly increase exports, bring the standard of living in the undeveloped nations closer to our own, create a mutually favorable common market, bring a dynamic democracy to the entire world, all at an accelerated pace, then we must resort to a future concept that is the next step upward on the ladder of corporate development. It is now in the process of evolution as our first super-corporation. The Attorney General, Robert Kennedy, characterized the proposed Satellite Communications Corporation as: "This is something different than anything that has ever been conceived in the United States. This is a revolutionary idea." When the functions of such broad based joint ventures are understood, they can be the means of profitably burying communism under a dynamic, capitalistic, free enterprise system.

The structure of such "intercorporations" is geared to provide the acquisition of adequate capital to pursue costly, long range ventures, beyond the capitalization capabilities of present corporate systems. They require no great deviation from the scope of personal corporate objectives and provide a means of reducing risk when profit potentials are remote, at a comparatively nominal investment to each corporate investor, as compared to the more certain probability of gain or other benefits they can achieve.

A large number of small companies merging into one integrated unit achieves the capabilities of the largest corporate giant, including that of hiring the best executive facilities their combined resources will allow. The coordination of the manufacturing processes by the "intercorporation," enables each of its corporate arms to mass produce one unit or part, which is then assembled by the parent body or one of its arms. Such highly specialized production facilities increase efficiency, reduce cost and provide adequate competition with such other corporate giants and foreign economies as well.

PROFIT-SHARING as an indispensable adjunct to the "intercorporate" concept and its component arms, can accelerate the development of a dynamic, free, private enterprise system. It is achieved by conversion of a part of labor's energies to invested capital. It requires that employees be granted the same inherent rights as other stockholders, including that of deciding policy decisions and changing management when they are dissatisfied with dividends. This may well be the link that would permit management and labor to utilize their joint resources in pursuit of a more vigorous growth of our industry and economy. Labor unions would then service their membership as "watch dogs," keeping management at top efficiency and winning the approval of the general stockholder, who may even be willing to pay for this service. Employees having a vested interest in the industry of our country, would eventually provide the tremendous amounts of capital available for the further expansion of industry and the creation of new jobs. This would remove the threat of automation to labor and of shorter work hours to management. It would raise our standard of living to a higher plateau and restore some of the rugged individualism that has been ebbing away in this country.

The trend toward an "intercorporate" concept that will in the future enable the free, private enterprise system to profitably industrialize the entire globe, may be observed in its evolutions. The present concept is to set up a factory

or branch office in a foreign country and operate it themselves. This is being modified to operate them as joint ventures in partnership with the local peoples. The current trend is toward a "loose consortium" to reduce costs. In Israel, they are selling their "know-how." In Argentina, foreign companies are permitted to manage oil companies, but not to own them. In Mexico, the government guarantees profit-sharing as an employee's right. Because a business can have losses, it is a reasonable assumption that one

day they will seek a vested interest that may enable them to help reduce such losses. Alien businesses will discover that not only is their degree of ownership reduced, but that

their voice in management is challenged when profits fall. It is but another step to consider that perhaps American industry need not own the factories in these lands at all, to increase its market potential.

The "intercorporation" provides a means of selling whole factories and everything that is required, so that developing nations can tap their natural resources and establish a balanced and integrated economy in any locale as a package. It also enables nations that could not otherwise afford to pay for them, using present corporate systems, to acquire such "packaged economies," on a form of installment payment plan. The risk to creditors and investors is considerably reduced because American management, technicians and techniques will train and guide the local peoples in their profitable operation, until they are qualified to assume independent ownership and these consultants can always be recalled to give further guidance on a fee basis whenever required.

SUPPLIERS of every form of material, finished product and service, noting the reduced risk and virtual assurance of profits and seeking to greatly expand their sales potential, would make their wares available on a form of installment purchase or delayed payment plan through participation in such broad based joint ventures. Financial institutions would participate directly as investors in these "intercorporations," and indirectly by financing individual participants not geared for such long range commitments. Other active participants, perceiving a refuge from higher tax brackets by burying their surpluses in such ventures, or with an eye to eventual profits and new markets that will spring up as the standard of living in these nations approaches our own, will find such investments quite attractive.

Since we are primarily concerned with the profitable sale of American manufactures abroad in markets which do not currently exist and not with the ownership of the factories we erect, it leads to a unique situation, whereby we can give these factories to the people whom we have found capable of learning to profitably manage and operate them. The institution of profit-sharing, based on the degree of responsibility assigned to each employee, including the right to change management as previously described, would assure that Red dominated and led unions could not disrupt the beneficial impact that these factories could bring, as well as enabling them to resist communistic doctrine.

Inasmuch as the basic concept is one of undertaking large-scale, long range ventures, at a reduced risk to any one corporate investor, a change of government that might be hostile could not bring a very great loss, because our investment would primarily consist of materials and service fees and they will have been repaid, at least in part, from the operation of the businesses we establish and therefore mostly represent lost potential profits. The large number of investors involved would further materially reduce the risk to any one of them and such losses could



*The owner of the
factory of intercorporate
system, which is not
a new thing.*

Comsat

News Digest

Compiled by the COMSAT Information Office
950 L'Enfant Plaza, S.W., Washington, D.C. 20024

Date March 16, 1970

No. 16 Vol. 9

FORBES, MARCH 15, 1970

Comsat Industries?

Should AT&T win approval to put up domestic satellites, Comsat says it may seek two big favors from Congress as compensation.

THE MOMENT OF TRUTH for Comsat may come some time this month, when the Federal Communications Commission is expected to announce entry requirements for companies interested in putting up a domestic satellite system. Comsat's future dimmed considerably in January when the White House sent a strongly worded memorandum to the FCC urging that the domestic satellite race be thrown wide open to all comers to encourage competition. FCC Commissioner Dean Burch, former campaign manager for Barry Goldwater, praised the White House suggestions and promised prompt action. To date, some 20 organizations have expressed interest.

There is unrestrained joy at American Telephone & Telegraph, but over at Comsat headquarters the mood is less jubilant. "This is obviously a very important step," says Dr. Joseph Charyk, Comsat president. "It will be very interesting to see how closely the FCC guidelines conform to the White House suggestions." Then he adds: "You see, they raise some very fundamental questions. Very little is said about what might be in the public interest. If the FCC ground rules are a complete mirror image of the suggestions, we would be concerned." Privately, irked Comsat officials describe the White House memo as "naïve" and "capricious."

It's not the number of potential competitors that bothers Charyk. He feels that most of them will quickly drop out of the race when they learn how expensive and risky a proposition a satellite system is (cost estimates run \$100 million-\$200 million). "There are really only two competitors at present that have enough traffic on their own hook to make a domestic satellite system viable with only their own traffic," he explains. "Those are AT&T and the three television networks. And if the only users of such a system were the three networks, it's a very marginal proposition."

What worries Charyk is AT&T. How can there be genuine "competition" when AT&T has such an overwhelming advantage? he asks. "With their traffic, AT&T is in an eminently advantageous position," he says. "Since they can route as much of their existing traffic via satellite as they wish, they should certainly be in a position to offer incremental capacity to other users at a lower price than a fellow like us who has the same total investment but no initial set of customers. We are prohibited

by law from dealing directly with users, you see. So the question of 'competition' becomes a very interesting one indeed."

Alternatives

If the FCC goes along with White House recommendations, it is conceivable that *both* a competing domestic satellite system and special-purpose satellites might be launched. Would Comsat still be interested in putting up domestic satellite systems? Charyk says perhaps it would. To make its system viable, Comsat is clearly counting on support from the three major television networks that currently pay AT&T \$65 million to distribute programs nationally and face a rate hike to \$80 million.

Comsat expects to play a major role, but if those hopes are dashed, Charyk feels Congress may be more inclined to go along with Comsat in other areas. Already under consideration, for example, is an international satellite communications system for commercial aviation. "Due to the vagaries of high frequency radio, aircraft midway across the Atlantic are frequently out of communication with either side," he explains. "Satellites would ensure continuous, high-quality communication between aircraft and ground. With the size and number of aircraft increasing sharply, the problem here is becoming more acute. We hope to have a system operable within two years."

Nor is this Comsat's only alternative, as Charyk sees it. If it is shut out of the domestic satellite system and plans for the aviation system fall through, Comsat could seek legislative approval to use its \$100-million cash hoard for diversification into related fields in communications and electronics. "We think we have a responsibility to our stockholders to pursue all possible avenues of investment for the capital we now have," Charyk says. "There is a real need in these fields and we think the opportunities are quite broad." ■

Charyk of Comsat



News Digest

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Telecommunications Reports

March 9, 1970

RESOLUTION PROPOSING COMPROMISE TO RESOLVE MANAGEMENT, VOTING ISSUES RAISES HOPES OF FINAL AGREEMENT AT CURRENT INTELSAT PLENIPOTENTIARY; PLAN DEVELOPED BY AUSTRALIAN AND JAPANESE DELEGATES TO BE CONSIDERED

A sudden turn in developments at the Intelsat conference raised hopes at the end of last week that a proposed compromise covering several basic issues could produce agreement on new definitive arrangements governing the International Telecommunications Satellite Consortium before the current plenipotentiary sessions end next week.

The Australian and Japanese delegations, which had earlier submitted recommendations separately to the conference on how some issues in dispute might be resolved (TELECOMMUNICATIONS, March 2), have now developed a joint proposal which will be formally presented at the session to be held Monday, March 9.

HIGHLIGHTS: Plan envisions new office of Secretary General and continuation of Comsat, under contract, as technical and operational manager during a six-year transitional period. . . Director General would then be appointed, during fifth year, as Chief Executive Officer, taking over functions of Secretary General and Comsat. . . Future top official would contract out technical and operational functions.

Since their earlier proposals were advanced, the Australians and Japanese have been meeting privately to reconcile differences in their respective documents. They have now drafted a proposal, dealing with the major issues of manager for the consortium and the question of voting, that was given to all of the delegations Friday, March 6.

While the various delegations were asked to study the resolution over the weekend, to prepare for Monday's debate, initial reaction of some was that the Australian-Japanese group may have found the key to settling key points in disputes that have threatened to prevent a final settlement.

With debate at the plenipotentiary sessions Monday through Wednesday of last week evidencing no real progress toward a settlement, there was a feeling in some quarters that the 1970 plenipotentiary conference would adjourn in the same manner as the first meeting last February-March, without a final agreement.

No sessions were held Thursday, March 5, because the international conference room in the U.S. State Department had to be used for the ceremonies at which President Nixon signed in Washington the nuclear non-proliferation treaty. When the Intelsat delegates resumed their meetings Friday, the existence of the Australian-Japanese document came to light when some of the smaller countries complained that they had not been furnished copies of it, while the larger nations had.

After it was stated that the limited number of copies made it impossible to distribute it to all members Thursday, it was agreed that additional copies would be made available immediately and furnished to all members so they can engage in the debate this week. One evidence of the importance being attached to the document is that after this matter was settled, the Friday sessions adjourned almost immediately.

On the manager issue, the proposed resolution of the Australians and Japanese recommends that the final agreement accept the full internationalization of management responsibilities after a transitional period. It calls for the appointment of a Secretary General by the Board of Governors as a first priority after the board is organized, and spells out the authority and responsibilities of the Secretary General contained in the basic document 45 developed by the preparatory committee during the interim since the 1969 plenipotentiary.

The Board of Governors, it is proposed, would give priority also to concluding a contract with the Communications Satellite Corp. to serve as technical and operational manager of the Intelsat space segment for a period of six years.

It was also suggested that the Secretary General would not be interposed between the Board of Governors and Comsat and would not exercise a supervisory role over Comsat. He would, however, be kept informed on Comsat's performance under the contract, and be present at, but not participate in, major procurement negotiations conducted by Comsat.

Comsat, under terms of its contract or as authorized by the Board of Governors, would sign contracts on behalf of Intelsat in the area of its responsibilities, but all other contracts would be signed by the Secretary General.

A year before the end of the contract period, or by Dec. 31, 1976 --whichever is earlier--the Board would appoint a Director General, subject to confirmation by the Meeting of Parties. The Director General would be the Chief Executive Officer of Intelsat, and the functions which had been performed by the Secretary General and Comsat would be taken over by the Director General.

The Director General's responsibilities would include contracting out technical and operational functions to the maximum extent practicable. These entities could include entities of various nationalities as well as an international corporation owned and controlled by Intelsat. The contractors would be responsible to the Director General who, in turn, would be responsible to the Board.

At the end of the current plenary, the proposal states, Comsat would begin reshaping its present staff organization so as to identify more clearly the elements engaged in duties to be assigned to the Secretary General, and those associated with Intelsat technical and operational management.

After the Board of Governors takes office, it would solicit from communications entities and organizations around the world statements describing their organization and procedures with particular reference to the integration of policy and management, and to management efficiency. Statements would also be requested from multinational ventures for implementing advanced technologies.

Within a year after it is organized, the Board of Governors would initiate a study to determine the most efficient and effective management arrangements consistent with the basic aims and purposes of Intelsat, its international character, and its obligations to provide, on a commercial basis, communication facilities of high-quality and reliability.

The study, it was stated, would give due regard to the information at hand on the experience of the national and international organizations from which statements have been requested, such experience as may have been gained from operations in the transitional period, and the policy expressed in the provision giving authority to the Director General to award contracts. Professional management consultants from around the world would also be used.

During the fourth year after the agreement is adopted, the Board of Governors would recommend the permanent organizational structure of the executive arm of Intelsat for consideration by the signatories and the parties, and by the end of the fifth year the organizational structure of the executive arm would be adopted.

On the question of voting in the Board of Governors, the proposal calls for voting shares to be based on international public telecommunications plus domestic public telecommunications of the special types covered in document 25. There would be a limit of 40% on the vote that may be cast by any one member, and the voting rules would be those prescribed by the preparatory committee in drafting document 25. Investment would be based on all use of the Intelsat space segment.

As for the structure of Intelsat, the latest document proposes that the Meeting of Parties and the Meeting of Signatories will be separate, independent organs. Provision would be made for the Meeting of Parties to meet within one year of the coming into force of the Definitive Arrangements and thereafter upon request of one-third of the members.

The functions of the Meeting of Parties, the Meeting of Signatories, and the Board of Governors would be as prescribed in document 25. This,

it was said, does not preclude the concept that the Meeting of Parties is the primary organization of Intelsat, but it does permit the concept that, except as specifically provided, it would have any powers with respect to functions specifically allocated to another organ. -End-

TIME FOR FILING COMMENTS IN GROUND STATION INQUIRY POSTPONED AGAIN;
WESTERN UNION SAYS TALKEETNA STATION PUTS NEW PERSPECTIVE ON QUESTION

Another extension of time for filing comments in the Federal Communications Commission's ground station ownership and operation inquiry was granted last week at the request of Western Union International. The time for filing comments was postponed from March 4 to Monday, April 6, while reply comments are now due May 4, instead of the previous March 31.

Meeting last week's previous deadline for filing comments, however, the Western Union Telegraph Co. said that establishment of a station at Talkeetna, Alaska, puts the question of ownership and operation of earth stations in a new light.

The telegraph company, which has not filed comments in earlier FCC inquiries on the ownership and operation question because they have been intended solely for international use, said that authorization of the Talkeetna station raises the possibility that this Alaska terminal and the stations at Brewster Flat, Wash., and Jamesburg, Calif., will be used for both international and domestic operations. For this reason, it stated, Western Union becomes interested in the proceeding.

In its comments, Western Union submitted that it "is inappropriate that any final policy affecting the ownership or operation of earth stations in the United States which are to be used. . .for communications in the area of domestic telegraph operations, be determined in this proceeding."

Instead, it suggested that a "more appropriate proceeding for consideration of matters in the area of domestic operations' is the domestic satellite inquiry. Pending a determination in the domestic satellite matter and the establishment of domestic earth stations, it added, "any determination herein should grant to the domestic telegraph carriers rights of ownership, lease, use and operation in existing earth stations in the event that such stations are used for domestic telegraph communications."

With particular reference to the Talkeetna station, Western Union said this facility should be used solely and wholly for communication in the area of domestic telegraph operations, and should not be used for international telegraph purposes.

International telegraph traffic, the company proposed, should continue to be routed to the international carriers through the existing gateway cities, and "No international telegraph carrier should be granted any right to participate in the use or ownership in the Talkeetna earth station." -End-

BURCH SEES DOMESTIC SATELLITE BENEFIT AS ADDED MEANS OF TRANSMISSION

The primary benefit of satellite communications is that a new means of transmission is added to those already available, Chairman Dean Burch of the Federal Communications Commission commented last week on the "Issues and Answers" interview program on the American Broadcasting Cos. television network.

Asked principally about the impact of a domestic satellite system on radio and television networking, Mr. Burch said the primary benefits in that area should be to increase the facility and flexibility of networking and "possibly" to reduce the cost. In reply to further questions about effects on radio and TV, he said a domestic satellite system could bring about a fourth TV network, or a network of interconnected community antenna TV systems.

Nonetheless, the FCC Chairman declared, it may be anticipated that whoever operates the domestic satellite system will be a common carrier-type system, subject to Commission licensing and rate regulation.

A final draft of a domestic satellite policy statement, responsive to the White House memorandum on the subject (TELECOMMUNICATIONS, Jan. 26), is now circulating at the FCC. Commission action on the subject should be forthcoming within several weeks. -End-

RECORD

National Press Club
March 5, 1970

"LIVE AND IN COLOR" television of President Pompidou's speech was provided via satellite to 14 European countries. The French broadcasting service "ORTF" leased the engineering and production services from CBS. And a feed was provided to N.E.T. which aired a 60-minute recorded "recap" of the luncheon that evening on Washington's Channel 26. Another closed circuit feed was also provided in color into the Club's Main Lounge with instantaneous translations for those NPCers and guests who couldn't get into the crowded ballroom. Below, artist's rendition, and extensive television and press coverage.



THE SUNDAY TIMES, 1 MARCH 1970

Remember All telephones are ANeurotic NNow

TIMOTHY JOHNSON on a modern
miracle causing world-wide chaos

STARTING TODAY, you can dial a call direct from London to New York, and talk for only 10s. a minute. All you have to do is to pick up the phone and dial 0101212 and then the number—but remember they are six hours behind on time.

On second thoughts, it would be better if Londoners with friends in New York did not all rush to the phone at once. The tightly stretched international exchanges would very quickly become overloaded. Then, of course, there are about 80,000 people in Britain who only wish they had a telephone at all, never mind making transatlantic calls.

Altogether, today's latest miracle of communications technology serves as yet another example of the painful paradox of the phone service. Technical advances are being achieved at an ever-increasing rate, mere distance is ceasing to be a barrier to communications, and yet in many countries the ordinary man finds it is difficult to get a telephone when he wants one, and the service it provides is deteriorating.

Somehow the Post Office, like all the other major telecommunications authorities in the world, has to catch up with the deficiencies in the service, while coping with a growth in demand for facilities averaging at least 10 per cent. a year—much more in some areas—and providing for entirely new services like computer communications and vision telephones. Achieving this means turning the whole giant Post Office Telecommunications business—with its £1,941 million of assets and 225,000 employees—into a new kind of animal with a faster heartbeat and a faster rate of change.

Edward Fennessy, managing director of Post Office Telecommunications, points out that the spread of the telephone service in any country historically follows an S-shaped curve—slow at first, then going through a period of explosive growth, and finally slackening off again as the market becomes saturated. The British telephone service is just moving into the explosive growth phase—and the other European coun-

tries are following just a little way behind.

This year the Post Office will install over one million new exchange connections—many will carry more than one telephone, of course—a rise of at least 25 per cent over last year. In January alone the orders for new connections were 119,000, by far the highest ever, even though it was a poor month for other consumer goods suppliers. By 1980 the number of exchange connections will have grown from 8.5 million to 18 million, and the telephone will have found its way into 72 per cent. of all the households in the country instead of only 32 per cent. today.

On top of all this there will be a still unpredictable demand for data transmission services to feed the computer octopus, for big-capacity links to support the beginnings of a video telephone service, and for facilities like telex and facsimile transmission.

First of all the Post Office has got to clear up its arrears. With a £2,500 million investment programme budgeted for the next five years, there should be enough money to plug the gaps. And Fennessy makes it clear that he is prepared to get tough with his suppliers—by applying penalty clauses, for example—if the late deliveries which have bedevilled progress in recent years continue much longer.

Phones for the year 2001

All these endeavours will be wasted if the Post Office repeats its earlier mistake of over-conservative forecasting. So it is particularly encouraging that the top management has become noticeably more radical and futuristic in its thinking over the past few years. And a long-range studies division—which with 40 specialists must be one of the biggest groups of its kind in Britain—has been set up under John Whyte. Half the team is working on a single huge project to predict the volume of traffic on the telephone network in 1975, 1986 and 2001.

Whyte makes the point that over this period there is going to be a big change in the telecommunications services as the customer sees them. Advances in communications will have a deep effect on the pattern of society, and

the changes in society will in turn react back on the communications system. This makes forecasting difficult, but fascinating.

What is most fascinating of all is that, after years of dismissing the idea as a twenty-first century dream, the Post Office is now rapidly getting used to the idea that it will be beginning a vision telephone service before 1980. The overwhelming problem with the vision telephone has always been that it requires such a huge amount of cable capacity. A telephone cable is just as strictly limited in its capacity as a railway tunnel, and a visionphone conversation needs a tunnel 100 times as big as an ordinary telephone chat.

But the cost of providing cable capacity has been falling steadily for as long as anyone can remember, and everyone expects it to go on falling for the next 20 years at least. This will make the economics of the visionphone much more attractive, and A T & T is now planning to open the first commercial service in New York and Pittsburgh this year, although it will be far too expensive for the ordinary domestic subscriber, even by US standards.

Reasonably enough, considering British conditions, the Post Office is taking rather a different tack and concentrating its immediate efforts on the development of a system it calls Confravision. This will allow groups of businessmen in studios hundreds of miles apart to have a conference together over high-quality sound and TV links. It will probably cost about £100 an hour, and Fennessy and others who have tried the experimental set-up say that after a few minutes it is almost as good as being in the same room with the people on the other side of the table.

The final decision to introduce Confravision has not yet been taken—market research is going on—but it will probably be available in about two

(cont'd)

years. The individual vision-phone will probably follow some years later after the first of the coming generation of very high capacity cables has been installed. But Whyte and his boss James Merriman, the development director, do not foresee the visionphone being an economic proposition in isolation. Instead they are looking forward to a whole complex of services, all taking advantage of the existence of a high-capacity trunk network.

Altogether the 1980s home could have £500 or more of entertainment and communications equipment hooked on to these services. As well as a vision phone this would include receivers for cable TV programmes—Rediffusion recently demonstrated a system which could give the customer a choice of 40 channels — and facsimile machines. At present it takes about five minutes to transmit a facsimile of a single foolscap page over a telephone circuit, but with cables of 100 times this capacity, it would be possible to transmit a complete newspaper during the early morning hours when no one else was using the system.

On top of all this there will be a big business demand for high capacity vision, facsimile and computer links. "Add all this together and a high capacity network starts to look viable," says Whyte. The biggest barrier is not technology, or even the likely cost of the service, but the huge investment in the existing system.

Traditionally the Post Office has spread the burden of this investment by writing it off over a long period—as much as 40 years in the case of cables. This means we are still relying on some pre-1930 equipment.

Equipment from the year 1890

But the older types of exchanges are quite incapable of providing the services people are going to want in future—the Post Office is still installing equipment which traces its lineage back to the Kansas City dentist called Strowger who invented the first automatic exchange in the 1890s. So the biggest long-term decision the Post Office must take is over how much it can afford to step up the pace of change.

The period of depreciation of telephone exchanges has already been cut from 30 to 25 years recently—thus adding about £5 million a year to the Post Office's costs. Now the new electronic exchanges are coming along—the board will almost certainly decide to standardise on the TXE4 design for large exchanges soon—offering the possibility of all kinds of special services, like faster, easier-to-use push-button telephones, and the automatic transfer of calls to another number if you go out for the evening.

So the Post Office must decide either to introduce these services in a few favoured areas, letting other customers wait up to 25 years before they can enjoy them, or to try and speed up the switchover to electronic exchanges everywhere. Just to complicate matters, much more advanced electronic exchange designs will be coming along meanwhile.

With the Post Office still struggling to catch up, discussions over whether it should start scrapping still-usable equipment in future, when demand will be growing even faster, may seem unrealistic. But the telecommunications industry has got to achieve this capability, otherwise the whole development of society will be held up.

For the one thing that all the market research and technological forecasting shows is that telecommunications is going to play an even more important role in society in future. This is not just because the telephone will become a universal necessity rather than a middle-class luxury—which has already happened in the US—but because it will provide the framework for so many other services. It all adds up to a great opportunity for the Post Office.

Already Europe tends to look to Britain for leadership in the introduction of such things as electronic exchanges and a network specially adapted for computer communications. The Americans are bedevilled by a political and commercial civil war and are currently much more pessimistic than the Post Office over the pace of change that will be possible. By 1980 Britain could have the most advanced communications network in the world—with all that implies for exports and internal growth.

And there is no good reason why the Post Office should

not be expected to take the opportunity. It has an absolute monopoly, far more complete than anything enjoyed by the other nationalised industries. Commercially it is in an ideal environment, if only it can keep up with demand. Traffic is growing all the time, which brings economies of scale and lower charges, encouraging yet more traffic, and so it goes on. Technologically, there is no limit in sight to what should be possible.

The one thing outside its control which could hold the Post Office back is the amount of money it is allowed to invest. If the country wants a good communications system it must be prepared to pay for it, and to keep on paying without the sudden cutbacks which have been so damaging before. In return the Post Office has got to foresee what people are going to want five, 10 or 20 years ahead and lead the way there, rather than following incredulously in the wake of public demand as it has tended to in the past.

THE EVENING STAR
Washington, D. C.
Monday, March 2, 1970

Proposals Asked

Communications Satellite Corp. has asked for proposals on construction of an antenna and related equipment on Kwajalein, Marshall Islands. The request, filed with the Federal Communications Commission, asked 34 companies to submit proposals on building a 97-foot-diameter antenna.

THE OBSERVER, 1 MARCH 1970

Dialling New York

IT IS now possible, from midnight last night, to dial New York direct from London. Ten shillings will buy a minute's conversation with any of the 2,500,000 subscribers in the Staten Island, Brooklyn, Queens and Manhattan areas.

Within two years, the service should be available to STD subscribers all over Britain.

THE ECONOMIST FEBRUARY 28, 1970

Unleashing cable TV

Bit by bit, the restrictions that have held back the growth of cable television are being lifted. Soon there may be a national hook-up of the local systems which bring television pictures into the home by wire, rather than over rooftop aerials, and this could become a major rival to national broadcasting and telephone networks. The Federal Communications Commission has just told the telephone companies, more or less, that they must stay out of the cable business. In any area where a telephone company provides local service, it may not own a system for distributing television programmes, according to the FCC's new rule.

The decision will not change life for the biggest of the companies. As long ago as 1956, the American Telephone and Telegraph Company promised to keep out of cable television on antitrust grounds. But AT&T is far from being the only telephone company; there are 2,100 others in charge of 17 million telephones or about one-sixth of the national total.

The FCC's decision hurts these so-called independents which were in a comfortable position to corner the growing market for the cable system which is technically capable of bringing 40 television channels or even more into a home. Telephone companies will be permitted to run telephones and television in separate towns and they may still lease wires to a cable company. But, except in some rural areas, the telephone companies must now watch the new information-channelling business (which will sell everything from entertainment and stock market reports to facsimile newspapers on a common-carrier basis) grow into an independent competitor.

The broadcasting industry must do the same and it is not happy. The FCC's moves to strengthen cable television were intensified last October when the commission ruled that the operators could originate their own programmes and even that the larger among them would be required to do so. The FCC also ruled then that cable companies could sell local advertising to pay for these. Moreover, the FCC gave permission for the cable companies to organise themselves into regional and national networks. The FCC's motive is clear. It wants to encourage diversity in television programmes and there are simply not enough channels available in the very high frequency range that most over-the-air broadcasting stations use for this to be possible. Cable distribution is about the only hope of getting not only variety, but also local participation, into television.

However, the FCC's restriction that cable television hates most—that it may not import signals from distant places into America's 100 largest cities—still remains. Cable companies in New York may not sell their subscribers shows from Boston or Washington, although technically they could do so. They must woo their subscribers by offering superior reception of the channels that are already available locally over the air (plus, occasionally, some original programmes). The broadcasters' strongest argument against letting cable television expand in these big markets is that this would add insult to injury; the cable operators pay nothing for the programmes that they take from the air as it is. But Congress may wipe out this argument with a new copyright Bill. This would specify that cable operators must pay royalties for copyrighted works that they re-transmit, while at the same time being freed from many of the restrictions about the importation of distant signals.

BROADCASTING, March 9, 1970

House hearings to start on telecommunications

The House Subcommittee on Executive and Legislative Reorganization begins two days of hearings today (March 9) on President Nixon's reorganization plan for telecommunications.

No witness list was available late last week, but the most important testimony will presumably come from administration spokesmen and from Representative Cornelius J. Gallagher (D-N. J.), who filed a disapproval resolution to the reorganization plan (BROADCASTING, Feb. 23).

Representative Gallagher, a member of the subcommittee's parent Government Operations Committee, filed the resolution as a "technical step" designed to insure that the proposed new telecommunications office in the executive branch would pledge special attention to two issues: computer privacy and alleged discrimination against the legislative branch (as opposed to the executive) in the use of free telephone service.

The New Jersey Democrat otherwise supported the reorganization plan and said it would create a "vitaly needed" new office.

The Nixon plan would create a new Office of Telecommunications Policy in the White House. The office would take on the duties now assigned to the director of telecommunications in the Office of Emergency Preparedness. It would serve as the President's principal advisor on telecommunications matters both inside and outside the executive branch.

THE EVENING STAR
Thursday, March 5, 1970

Cardullo Heads CSC Inc.

N.W. Cardullo has been elected president of Communications Services Corp. Inc., newly formed Rockville company specializing in medical services and communications systems. He formerly was planning officer for Communications Satellite Corp. Other officers of the new company are: John L. Miller, former director of tactical weapon systems for Martin Marietta Corp., vice president of marketing; James W. Jordan, former assistant comptroller and budget director of the Pennsylvania Railroad, vice president and treasurer; and William L. Parks, former technical director of Jonker Corp., vice president of engineering.



Cardullo

THE WALL STREET JOURNAL,
Friday, March 6, 1970

ITT Unit Will Cut Rates On Overseas Service April 1

NEW YORK—ITT World Communications, a subsidiary of International Telephone & Telegraph Corp., said it is cutting rates 15% to 20% in record-communication services between the U.S. and 16 European countries. The new rates cover Telex, privately leased telegraph and voice-data circuits.

Telex rates will drop 15% and the others 20%, ITT World said. The Telex rate to countries where one-minute minimum service is available will be reduced to \$2.55 a minute from \$3; and in areas where the three-minute minimum applies, the cut will bring charges to \$7.65 from \$9.

The new rates, effective April 1, are the result of savings made possible by the new, high-capacity transatlantic Mediterranean cable.

VARIETY

Wednesday, March 4, 1970

HOUSE UNIT TO HEAR NIXON TELECOM PLAN

Washington, March 3.

President Nixon's plan to reorganize the White House Office of Telecommunications Policy with broader powers was set for a hearing March 9-10 before the House Executive and Legislative Reorganization Subcommittee.

No major opposition to the plan is expected to emerge, though such opposition is considered pos-

sible. Some Congressmen reportedly are concerned that the new White House group will assert so much authority that it should be authorized only by legislation, and not by Presidential reorganization. Subcommittee chairman is Rep. John Blatnik (D-Minn.), and he will also take testimony on the objection to the reorganization filed by Rep. Cornelius Gallagher (D-N.J.) who raised essentially technical questions while supporting the primary idea of the reorganization.

Martin Joins Comsat

John L. Martin Jr., a retired Air Force major general, has joined Communications Satellite Corp. as a special assistant to the president. Martin retired from the Air Force last Feb. 1 after nearly 30 years of service. His last assignment was assistant for systems acquisitions management under the commander of the Air Force Systems Command at Andrews Air Force Base. Martin holds degrees from Polytechnic Institute of Brooklyn and Massachusetts Institute of Technology.



Martin

Consent

March 6, 1970

To: Dr. Lyons

From: Eva Daughtrey

Attached are two copies each for the years
1963-1969 of the President's Report to Congress
on Activities and Accomplishments under the
Communications Satellite Act of 1962.

Hope these are what you had requested.

Attachments

FROM: DIRECTOR OF TELECOMMUNICATIONS MANAGEMENT

TO: Eva

DATE: March 5th

They arrived a day early. Now you have the latest and are up-to-date.

timmie white

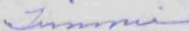
Atch (2)

FROM DIRECTOR OF TELECOMMUNICATIONS MANAGEMENT

TO: Eva

DATE: March 3rd

The Report for 1969 is not yet back from the printers. It is due in Friday of this week. However if you are in a hurry you can get two copies from Mr. Hopkins. Mr. Hopkins was furnished 50 copies -- I'm sure he wouldn't mind. If you are not in a rush I'll be happy to send you the '69 report as soon as we receive them.


timmie white

Coniset

UNITED STATES GOVERNMENT

Memorandum

TO : Dr. C. T. Whitehead

DATE: 3 March 1970

FROM : IOP/C - William N. Lyons

L

SUBJECT: Attached

FYI

COMMUNICATIONS

Comsat loses some thrust

Communications Satellite Corp., a bright star in the space galaxy, may be facing a double eclipse. Domestically, the Administration appears bent on denying Comsat any possibility of playing a monopoly role in space communications. Internationally, both foreign and domestic communications carriers seem determined to slice away the company's majority ownership of the International Telecommunications Satellite Consortium (Intelsat) and terminate its contract as manager of Intelsat's operations.

Despite a rapid rise in operating revenues from \$2.1-million in 1965 to \$47-million in 1969, investors have reacted queasily to the uncertainties plaguing Comsat. The company's stock, which once sold as high as \$71 after the initial offering in 1964 was oversubscribed at \$20, dropped to a low of \$36 this year and is currently selling in the low 40s.

Sniping. Internationally, Comsat is under fire from nearly all the existing communications establishments—both U.S. international carriers and the government-owned communications arms of other countries. Even though U.S. communications companies own 37% of Comsat, none controls it. Some are openly resentful of the company's interference in long-term arrangements between foreign and U.S. carriers. American Telephone & Telegraph Co. has even threatened by letter to withhold support from Comsat in international matters unless it stopped disturbing AT&T's relationships with its foreign counterparts. Hostility between Comsat and U.S. international carriers has grown ever since the Federal Communications Commission ordered cable operators to send a portion of their business by satellite in order to guarantee traffic for Comsat.

Foreign carriers, particularly those with established undersea cable systems and advanced domestic communications technologies, see Comsat as a brash newcomer upsetting their estab-

lished operations and as a source of U.S. pressure on their own telecommunication policy. Further, some are loath to accept U.S. leadership through Comsat's position as majority stockholder and operator of Intelsat. The Intelsat consortium boasts 74 countries as member-owners, now meeting in Washington, and many would settle for cutting Comsat's ownership from slightly over 50% to 40%.

Yet another objection from foreign countries is Comsat's role as manager-operator of Intelsat. Dissenters believe Intelsat should have its own operating and managerial organization.

Undamaged. The international fracas is hardly likely to ruin Comsat. Even if it accepted all the negative terms that foreign countries are pushing, Comsat still remains, by legislation, the chosen U.S. instrument for all international satellite communication. So it will still be the "carrier's carrier" for all communication relayed by Intelsat, just as it is now. Reduced Intelsat ownership and loss of the managerial spot would not cut international revenues significantly. Currently, Comsat's management contract with Intelsat amounts



Chairman McCormack sees Comsat's role as 'honest broker,' in communications.

to a slim \$140,000 per year, which just about covers costs. The major injury to Comsat would be reduced control of the system and loss of prestige.

Comsat's domestic outlook dimmed seriously with the President's task force report released in late January recommending competition in satellite communications within U.S. boundaries. Washington observers expect the FCC will go along with most of the suggestions in the report. But chances are good that the agency will take a long, hard look before accepting the policy.

In recommending that the FCC open up satellite communications to vir-

tually anyone capable of supporting a system, the White House report sent two of Comsat's biggest potential customers for domestic service into action to set up their own systems.

■ American Telephone & Telegraph announced it would apply for a satellite system to augment its ground network. Once AT&T gets involved in the space segment, observers point out, it would inject all the old problems of terrestrial regulation into orbit, along with the new complications of operating a competitive space system over a monopoly ground network. At the minimum AT&T's entry would scotch the possibility of significant revenues from telephone services for Comsat.

■ Broadcasters, the second largest potential customers for satellite communications relay services, also started moving toward their own satellite distribution system. That could divert up to \$40-million in revenues.

Clientele. Without these customers, Comsat's domestic survival may depend on serving a gaggle of smaller operations—data communications, community-antenna television distributors, aircraft communications, and possibly new and untried services. That may be tough to do. Teleprompter Corp., a leading CATV company partially owned by satellite builder Hughes Aircraft Co., may put up its own system, according to Chairman Irving B. Kahn. Teleprompter withdrew an offer to buy into Comsat when the White House released its report.

At Comsat, Chairman and Chief Ex-

Despite the setbacks, McCormack says 'Don't count us out'

ecutive Officer James McCormack admits that recent developments at home and abroad look like serious setbacks. But he warns against "counting us out too quickly." By serving a number of customers, McCormack believes, Comsat will be able to take advantage of economies inherent in large-scale operations.

A \$15-million launching will put up a satellite with five times the capacity of a \$5-million rocket, for example. With such reasoning, Comsat will try to persuade the broadcasting industry to use its system. McCormack believes that the communications industry needs an "honest broker" like Comsat for satellite services.

But being an honest broker competing with the Bell long lines monopoly on one side and the political swat of the broadcasting industry on the other is a long way from Comsat's original goal of having space all to itself over the U.S. The next move is up to the FCC, which will act on applications for satellite systems this year. ■

NEWSWEEK
February 2, 1970

THE MEDIA

Open Skies

For ten years now, communications satellites have been spinning overhead, bouncing television, telephone and other electronic signals from one continent to another. But no satellite has yet been able to relay signals from one U.S. city to another, simply because the U.S. Government has been unwilling to make up its mind who should operate a domestic satellite. Last week, in a move that is likely to have widespread effects on the economics and operations of U.S. communications, President Nixon took a stand against a domestic satellite monopoly. Instead, in a memo to the Federal Communications Commission, the White House recommended an "Open Skies" policy under which virtually anyone could have his own domestic satellite system as long as he had the money and the technical expertise.

The decision rests with the FCC, which may well prove agreeable. But it could still be tested in the courts by an aggrieved Communications Satellite Corp. (Comsat), which contends that it alone was authorized by Congress to operate any U.S. satellite. The White House memo sent Comsat stock plummeting 6% points.

Although fifteen to twenty such satellites can hang comfortably in U.S. airspace without interfering with one another, it is unlikely that American skies will soon be filled up. Few organizations can afford the minimum of \$16 million that the National Aeronautics and Space Administration probably will have to charge for satellite launchings, let alone the costs of maintaining a complex communications system that can run up to \$35 million a year. But to the three major commercial television networks these prices now look like a bargain. American Telephone & Telegraph, which transmits their signals from city to city through its land lines, has raised their collective phone bill to \$65 million a year.

With a jointly owned satellite containing thirteen or fourteen channels, the networks figure, they could rent space to outsiders for transmitting such signals as wire service copy and computer data. (Adapting a Ford Foundation plan, they have offered to give public TV a free ride.) Accordingly, executives at all three networks were enthusiastic about the President's Open Skies plan. "It is practical, realistic," said CBS president Frank Stanton, "and should remove the roadblocks which have been delaying a satellite system." One executive, in fact, said that the networks were already hiring engineers to get the job started.

THE DENVER POST

A blow against Comsat

THE Communications Satellite Corp. (Comsat), a public-private telecommunications firm, has often been pointed to as a model type of organization for dealing with national public service problems.

The Nixon administration, for example, has lately been considering a Comsat approach (dubbed Railpax) as means of reviving essential railroad passenger service between major cities.

Yet despite growing acceptance of this approach, the White House last week issued a policy statement encouraging the development of commercial domestic satellite communications systems by any and all companies "to the extent that private enterprise finds them economically and operationally feasible."

The policy statement does not preclude Comsat from participating in the establishment of such domestic systems, but it certainly dilutes Comsat's role.

Ironically, Comsat has the greatest experience and expertise in commercial telecommunications service, and any private firms seeking to enter the domestic satellite market would undoubtedly have to borrow know-how from Comsat.

We wonder if this is what Congress envisioned when it established Comsat in 1962 as a special public firm to spearhead development of a satellite system for worldwide telecommunications.

The new White House policy completely overturns a 1968 presidential commission report which proposed that a single pilot domestic satellite system be used to test the market.

Of course, the Federal Communications Commission, which has the final say, does not have to adhere to the new White House statement. But it is highly unlikely that Dean Burch, the new FCC chairman appointed by President Nixon last year, will oppose the administration's position.

WE WOULD have preferred to have seen Comsat, with its known resources and public service orientation, given a chance to determine in orderly fashion whether a domestic satellite system was feasible.

It is difficult to see at this point how the expected wild scramble among companies, aimed particularly at soliciting business from the television networks, will best serve the public interest.

Personal

Hagerty
Wah

Tuesday 3/3/70

2:50

Karen Jordan, COMSA T, called. She had a couple of changes to the biographical sketch on William Hagerty (see attached sheet) and also a list of 15 affiliations of Dr. Hagerty's which she is sending over.

554-6200



COMMUNICATIONS SATELLITE CORPORATION

March 3, 1970

Miss Judy Morton
Office of Dr. C. T. Whitehead
Executive Office Building
Room 110
17th & Pennsylvania Avenue, N. W.
Washington, D. C.

Dear Miss Morton:

It would seem that the attached press release on Dr. Hagerty was prepared by the Office of Information in connection with announcing his Presidential appointment to the Board in August 1965 (to fill the vacancy created by the resignation of Dr. Clark Kerr).

Dr. Hagerty is now 53 years old.

Dr. Hagerty responded to a Memorandum for Directors (1/9/69) requesting information on current activities for inclusion in the 1969 Proxy Statement. He has not yet responded to this year's Questionnaire for Directors.

If I can be of further assistance - for instance getting in touch with Dr. Hagerty's office and compiling a new biographical summary - I'll be happy to; please let me know.

Sincerely,

A handwritten signature in cursive script that reads "Karen R. Jordan".

Karen R. Jordan
Assistant for Shareholder Relations

Enclosures (2)

Biographical Sketch of
WILLIAM WALSH HAGERTY

Dr. Hagerty, ⁽⁵³⁾49, a native of Minnesota, is President of Drexel Institute of Technology, Philadelphia, Pennsylvania.

He has been engaged in the teaching profession in the field of engineering at a number of universities since 1940.

Dr. Hagerty received his Bachelor of Science in Mechanical Engineering from the University of Minnesota in 1939; Master of Science, University of Michigan, 1943; Doctor of Philosophy, University of Michigan, 1947. He was awarded an honorary degree of Doctor of Science, Pennsylvania College of Optometry, ^{in 1965?} this year.

Prior to becoming President of Drexel Institute in 1963, Dr. Hagerty was at the University of Texas from 1958 to 1963, where he was Dean of the College of Engineering.

From 1955 to 1958, he was Dean of the School of Engineering, Director of the Engineering Experiment Station and Professor of Mechanical Engineering at the University of Delaware.

He also was Professor of Engineering Mechanics at the University of Michigan, where he served from 1942-1955; Instructor in Mechanical Engineering, University of Cincinnati, 1941-1942; Instructor in Mechanical Engineering, Villanova University, 1940-1941.

Dr. Hagerty has performed consultant work for numerous companies in the fields of fluid mechanics, thermodynamics and heat transfer. Before entering the teaching profession, he worked five years for the Great Lakes Pipe Line Company and the United States Gypsum Company.

He is the author of numerous papers in technical fields and engineering education, and a member of a number of fraternities and honorary engineering societies, including Sigma Xi, Pi Tau Sigma, Phi Kappa Phi, Tau Bett Pi and Sigma Gamma Tau.

Dr. Hagerty was born in Holyoke, Minnesota, June 10, 1916. He and Mrs. Hagerty have two sons and one daughter, and live in Berwyn, Pennsylvania, Dr. Hagerty's mother and three married sisters all reside in Minnesota. His father is deceased.

###

COMMUNICATIONS SATELLITE CORPORATION
Office of the Secretary

January 9, 1969

MEMORANDUM FOR DIRECTORS

In connection with the preparation of material for this year's Annual Meeting of Shareholders, it would be appreciated if you would list in the space below (i) those corporations (other than COMSAT) of which you serve as a director or officer, and (ii) other notable civic, business or academic activities in which you may currently be participating.

Kindly return this sheet, with your name shown at the bottom, either in the enclosed stamped reply envelope or to us directly when you attend the Board Meeting on January 17.

United States Coast Guard Academy, Chairman Advisory Committee
Central-Penn National Bank of Philadelphia, Board of Directors
Chamber of Commerce of Greater Philadelphia, Board of Governors of
Commerce and Industry Council
Commission on Engineering Education, Director
Commission on Presidential Scholars, Selection Committee
Communications Satellite Corporation, Board of Directors
Jefferson Medical College and Medical Center, Board of Trustees
Martin Marietta Corporation, Board of Directors
National Aeronautics and Space Administration, Consultant to Administrator
National Science Board, Board of Directors
Philadelphia Commission on Higher Education, Vice President
Philadelphia Electric Company, Board of Directors
Southeastern Pennsylvania Development Fund, Chairman
West Philadelphia Corporation, Vice President
University City Science Center, Executive Committee
WHYY-TV, Board of Directors

W.W. Hagerth
Name

January 16, 1969
Date

Monday 3/2/70

Conrad
Personnel

3:15 General McCormack called Dr. Hagerty. ^{Wm.} Hagerty
is out of the country (in the Carribean) this week -- they
expect him back next Tuesday. He will get in touch
with him then.

Also wanted you to know he had underestimated his age.
He is 53 -- 54 in June.

*Requesting
Resume from
Conrad*

OUT

OUT TO	FILE NUMBER OR NAME OUT	DATE	OUT TO	FILE NUMBER OR NAME OUT	DATE	OUT TO	FILE NUMBER OR NAME OUT	DATE
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DSS

9/20/12

Box 10 (Jackie's labels), Folder "Telecommunications - Comsat"

4) Note to Don Baker fm. Tom Whitehead dtd. 3/17/70, forwarding Inter-Office Memo to Federal Communications Commission fm Chief, Common Carrier Bureau, General Counsel, and Chief Engineer, For Special Meeting 3/13/70, subj: Domestic Satellite, 1 p., "Personal and Confidential"

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Department of Justice
Washington

JAN 20 1970

MEMORANDUM FOR DR. CLAY T. WHITEHEAD
Staff Assistant, Office of the President

Re: Domestic Communications Satellite Program

This supplements my letter to you of today's date on the above subject.

We think it advisable to call to your attention a preliminary question not mentioned in your memorandum of November 7, but necessarily raised by any proposal for a domestic communications satellite program which does not involve seeking additional legislation. Since the prospective operators of communications satellite systems would not have the facilities for launching their satellites, you have informed us that it is the premise of all proposals for commercial domestic satellite communications systems that the National Aeronautics and Space Administration would be able to offer launch facilities and services to the operators of such systems on a reimbursable basis. There is some doubt whether NASA presently possesses such authority.

The Comsat Act specifically directs NASA to furnish satellite launching and associated services on a reimbursable basis to Communications Satellite Corp. ("Comsat"), the corporation chartered under that act. However, the act does not provide authority for furnishing such services to any other operator of a satellite communications system.

NASA contends that such authority may be found in NASA's basic legislation, the National Aeronautics and Space Act of 1958 ("Space Act"), 42 U.S.C. 2451-76. Section 203 of the Space Act, 42 U.S.C. 2473, provides, in relevant part:

"(a) The Administration, in order to carry out the purpose of this act, shall -

"(1) plan, direct, and conduct aeronautical and space activities;

* * *

"(b) In the performance of its functions the Administration is authorized -

* * *

"(5) * * * to enter into and perform such contracts, leases, cooperative agreements, or other transactions as may be necessary in the conduct of its work and on such terms as it may deem appropriate * * *.

"(6) to use, with their consent, the services, equipment, personnel, and facilities of Federal and other agencies with or without reimbursement, and on a similar basis to cooperate with other public and private agencies and instrumentalities in the use of services, equipment, and facilities. * * *."

There is no question that the quoted authority in section 203(b) authorizes NASA, under certain circumstances, to launch satellites on a reimbursable basis for private corporations. This has been done, notably in the instance of the Telstar satellite launched for AT&T, and we are not aware that the legality of NASA's action has ever been challenged. However, Telstar was an experimental satellite, and there is a question whether NASA's authority to supply launch and associated services to private firms is not limited to situations in which the launch or operation of the satellite is for scientific purposes.

This question derives from the Space Act's definition of the term "aeronautical and space activities." Section 103 of the Space Act reads as follows:

"As used in this act -

"(1) the term 'aeronautical and space activities' means (A) research into, and the solution of, problems of flight within and outside the earth's atmosphere, (B) the development, construction, testing, and operation for research purposes of aeronautical and space vehicles, and (C) such other activities as may be required for the exploration of space; and

"(2) the term 'aeronautical and space vehicles' means aircraft, missiles, satellites, and other space vehicles, manned and unmanned, together with related equipment, devices, components, and parts."

It has been argued, in particular, by Comsat, that this definition limits NASA's authority under section 203 to activities related to research and development, so that furnishing launch services for a commercial satellite system would not be within NASA's authority.

In April 1969 this Office considered this problem in connection with a proposal that NASA provide launch services on a reimbursable basis for a domestic communications satellite for the Government of Canada. At that time NASA submitted to us a memorandum taking the position that NASA could provide launch services to either foreign governments or private interests for either experimental or operational satellite systems. Comsat argued that NASA lacked authority to furnish the services. We upheld Nasa's authority to furnish the launch services to Canada on the basis of those provisions of the Space Act, §§ 102(c)(7), 205, 42 U.S.C. 2451(c)(7), 2475, relating particularly to international cooperation. Letter of April 29, 1969 from myself

to the Legal Adviser of the State Department. We did not reach, therefore, the question whether NASA could provide such launch services to private interests.

As a legal matter the question appears to us a fairly close one. On the one hand, if one assumes that NASA's authority is limited to carrying on "aeronautical and space activities" within the literal definition of section 103, the making available of launch and associated services to operators of a domestic communications satellite system does not appear to be within the scope of such authority. Even if one were to argue that there would be scientific value in additional satellite launches, it appears to be the essence of the proposal you are considering that NASA would offer its services to any and all system operators approved by the FCC without any determination of the scientific value of their satellite or their system.

On the other hand, we recognize that a plausible case can be made for NASA's authority. The definition of "aeronautical and space activities" in section 103 was added to the 1958 legislation in Senate-House conference. The conference report throws some light on what the conferees had in mind:

"The purpose is to make clear that the act is concerned primarily with research, development, and exploration. The use of the word 'activities' is intended to be broad in the area of outer space because no one can predict with certainty what future requirements may be.

"It is not the intention of Congress, however, to construe activities so broadly as to include such

things as the operation of commercial airlines, the control of air traffic, the fixing of air-worthiness standards, the setting of air fares, or the assigning of certificates of public convenience and necessity. Whether, in time, the new Administration will run a regular transport route to another planet or to the moon is not a matter of current concern. But the term 'activities' should be construed broadly enough to enable the Administration and the Department of Defense, in their respective fields, to carry on a wide spectrum of activities which relate to the successful use of outer space. These activities would include scientific discovery and research not directly related to travel in outer space but utilizing outer space, and the development of resources which may be discovered in outer space." 1958 U.S. Code Cong. & Adm. News 3192.

It is perhaps significant that the examples cited of activities excluded from NASA's responsibility by section 103 all involve regulatory authority and most would duplicate the responsibility of other agencies. They seem easily distinguishable from the provision of launch services. Furthermore, launch services could certainly be interpreted as within "a wide spectrum of activities which relate to the successful use of outer space," and might reasonably be regarded as part of "the development of resources which may be discovered in outer space," if we read "resources" to include the potentiality for using outer space for transmitting communications.

Moreover, a too literal interpretation of "aeronautical and space activities" may create difficulties elsewhere in the Space Act. Thus, section 102(c)(7) provides that the "aeronautical and space activities of the United States shall be conducted so as to contribute materially to * * * cooperation by the United States with other nations * * * in work done pursuant to this act and in the peaceful application of the results thereof." If NASA is limited to aeronautical and space activities, as narrowly defined, it would be unable to cooperate in the peaceful application of the results of such activities.

Evidently, to give effect to section 102(c)(7), one must interpret the term "activities," at least as applied to that subparagraph, to include the application of the results of research, etc., and we so construed it in our April 29 letter.

The other legislative history which has been cited for and against NASA's claimed authority in this area does not appear to us to resolve the question. In 1962 testimony on the Comsat legislation, Dr. Dryden, Deputy Administrator of NASA, indicated that if the legislation were passed, NASA would not launch an operating communications satellite for any private firm other than Comsat, but his testimony, considered as a whole, cannot be read as asserting that NASA lacked legal authority to do so.^{1/} Somewhat more significant, perhaps, was a colloquy between Dr. Dryden and Senator Pastore at a hearing held in 1963 after the passage of the Comsat legislation:

Sen. Pastore: "I am making a distinction between firing a satellite for experimental purposes, and that is what Telstar is, against the fact that we have created a private corporation, to engage in a commercial business of telephony and video and what have you, insofar as commercial use of a satellite.

"Now, I quite agree that the NASA had the right to charge and to allow A.T.&T. to shoot up an experimental satellite. * * * But it certainly hasn't got the power to grant A.T.&T. the right to shoot up a satellite and use it for commercial purposes and make a charge for it, without an act of Congress."

Dr. Dryden: "That is right."^{2/}

^{1/} "Communications Satellite Act of 1962," Hearings before the Senate Foreign Relations Committee, 87th Cong., 2d Sess., 262-66.

^{2/} "Satellite Communications," Hearing before a subcommittee of the Senate Commerce Committee, 88th Cong., 1st Sess., 67. It might be noted that Senator Pastore was Chairman of the Subcommittee on Communications and had been one of the leading supporters of the Administration's Comsat bill in 1962.

NASA has explained this colloquy as relating not to NASA's lack of authority to launch an operational satellite, but to "the lack of authority * * * in the other corporation to operate a commercial satellite system in competition with Comsat, because of the exclusive right Comsat had been given, under the Comsat Act, to establish and operate the global commercial communications satellite system."^{3/} This does not appear to us to be the most natural reading of the colloquy, but it must be recognized that exchanges such as this tend to be somewhat imprecise. What is significant is that, for whatever reason, both Dr. Dryden and Senator Pastore appeared to assume that any launch of a communications satellite other than on an experimental basis for a commercial user other than Comsat would require new legislation.

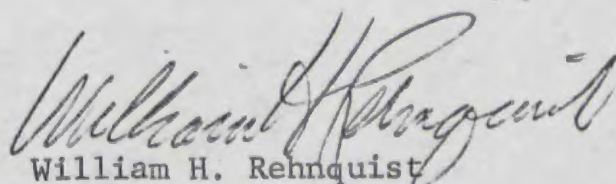
We see no need at this time to take a definite position regarding NASA's launch authority. The question seems fairly open to dispute, and it would not be appropriate for us to decide it without giving NASA and any other interested agencies a chance to present their views. An actual dispute has not arisen, and it is not entirely clear in what context one might arise. Comsat will probably question NASA's right to provide launch services, as it did at the time of the Canadian satellite proposal. However, it is extremely doubtful that Comsat would have standing to challenge NASA's authority in court. Alabama Power Co. v. Ickes, 302 U.S. 464, 479-81 (1938); Kansas City Power & Light Co. v. McKay, 225 F. 2d 924 (C.A. D.C. 1955), cert. denied, 350 U.S. 884 (1955).

Within the Government the feasibility of NASA's offering launch services would depend on the General Accounting Office's permitting NASA to credit reimbursements for launch services from satellite operators to its appropriation account, rather than to cover them into the Treasury as miscellaneous receipts, 31 U.S.C. 484; see 10 Comp. Gen. 510 (1931); 34 Comp. Gen. 577 (1955). Obviously, if such payments were not credited to NASA's appropriation, NASA would have to budget separately for anticipated costs of furnishing launching services. NASA informs us that GAO has in the past

^{3/} NASA's Memorandum of Law dated March 5, 1969, p. 21.

permitted reimbursement for services rendered in connection with Telstar and other similar projects to be credited to the NASA appropriation. Conceivably, GAO might regard the question of the treatment of the reimbursed funds as hinging on NASA's authority to furnish the services. However, NASA informs us that it anticipates no difficulty from GAO on this score.

Since NASA concludes that it has the necessary authority and is prepared to proceed on that basis, there does not appear to be any occasion for an opinion from this Office at this time.

A handwritten signature in dark ink, appearing to read "William H. Rehnquist", is written over the typed name.

William H. Rehnquist
Assistant Attorney General
Office of Legal Counsel

Department of Justice

Washington

JAN 20 1970

Dr. Clay T. Whitehead
Staff Assistant
Office of the President
The White House
Washington, D. C. 20501

Dear Dr. Whitehead:

This is in response to your memorandum of November 7, 1969, requesting our views on certain legal questions arising in connection with your consideration of the domestic satellite issue.

The questions in your memorandum were divided into eleven categories. Those in paragraphs 9, 10, and 11 were referred to the Antitrust Division, which has replied to you directly. The questions in paragraphs 3 through 8, inclusive, appear to relate exclusively to the authority and responsibilities of the Federal Communications Commission under the Communications Act of 1934, 47 U.S.C. 151-609. We have no special familiarity with this statute, and we do not believe that we can offer any helpful comment on the questions contained in paragraphs 3 through 8.

We shall, therefore, limit our discussion to the questions in the first two paragraphs, which deal primarily with the effect of the Communications Satellite Act of 1962 (the "Comsat Act"), 47 U.S.C. 701-44, on the domestic satellite issue.

Applicability of the Comsat Act

Your questions subsumed in paragraph one may be summed up as follows: Does the Federal Communications Commission have authority to license a domestic communications satellite system operated by an entity other than Comsat notwithstanding the provisions of the Comsat Act? We believe that the Commission does possess such authority.

There is no serious question that, apart from whatever may have been the effect of the Comsat Act, a domestic communications satellite system would fall squarely within the jurisdiction of the FCC under the Communications Act of 1934. "Radio communication" is defined by section 3(b) of the Communications Act, 47 U.S.C. 153(b), to mean "the transmission by radio of writing, signs, signals, pictures, and sounds of all kinds, including all * * * services * * * incidental to such transmission." Section 301 of the Act, 47 U.S.C. 301, provides that no person shall operate any apparatus for the transmission of energy or communications or signals by radio except in accordance with the Act and with a license granted by the Commission.^{1/} At the time the Comsat bill was before Congress, it was generally understood that the FCC already had jurisdiction of satellite communications.^{2/} The question, therefore, is whether the Comsat Act precludes the FCC from licensing domestic communications satellite systems, either by granting Comsat exclusive rights or by reserving to Congress the right to provide for future systems by legislation.

Section 102(d) of the Comsat Act, 47 U.S.C. 701(d), provides:

"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 if otherwise required in the national interest."

^{1/} Section 301 might conceivably be inapplicable to certain radio communications wholly within a State, see § 301(d), but it would seem clearly to apply to any radio communication via satellite, even where both ground stations were within a single State. See California Interstate Telephone Co. v. F.C.C., 328 F. 2d 556, 560 (C.A. D.C. 1964).

^{2/} See testimony of Chairman Minow, "Communications Satellite Act of 1962," Hearings before the Senate Foreign Relations Committee, 87th Cong., 2d Sess., 81-82; letter from Assistant Attorney General Katzenbach, "Communications Satellite Legislation," Hearings before the Senate Committee on Aeronautical and Space Sciences, 87th Cong., 2d Sess., 408.

This demonstrates that Congress did not intend by the Act to rule out either (1) use of the Comsat system for domestic services or (2) the creation of additional systems "to meet unique governmental needs or if otherwise required in the national interest." The question of the use of the Comsat system for domestic services will be considered below in connection with the questions raised by paragraph two of your memorandum.

It may be assumed that the establishment of commercial domestic communications satellite systems independent of the Comsat system cannot be justified on the basis of "unique governmental needs." Nevertheless, such systems would be permitted if "required in the national interest." While the legislative history of the Comsat Act indicates that the Administration officials supporting the bill doubted whether additional commercial systems would be economically and technically feasible, it also demonstrates that such systems were not to be precluded.^{3/} In particular, Senator Church, in introducing an amendment, acceptable to the Administration, which added language conforming section 201(a)(6) to section 102(d), emphasized that "alternative systems" could be established in the national interest "under private or public management." 108 Cong. Rec. 16362.

Bearing in mind the general principles that Government grants must be strictly construed, United States v. Michigan, 190 U.S. 379, 401 (1903), and that a franchise to function as

^{3/} When asked whether section 102(d) precluded a monopoly, Assistant Attorney General Katzenbach replied:

"No, Senator, I don't think it precludes monopoly. The intention of that, obviously, was to allow for the ADVENT program, for example, by the Government. We did not preclude other systems, the possibility of other systems, simply because this is a new and developing art.

"Frankly, with the capacity that satellites have, I cannot see why there would be a competing system. I don't think the statute permitting another system to be created, if it is found to be in the public interest, is in any sense a guarantee that that system is going to be created."

Hearings before Senate Committee on Aeronautical and Space Sciences, op. cit., supra note 2, pp. 401-02.

a public utility does not create a right to be free of competition, in the absence of a specific provision to that effect, Charles River Bridge v. Warren Bridge, 11 Pet. 420, 548-49 (1837); Tennessee Power Co. v. T.V.A., 306 U.S. 118, 139 (1939), we think it clear that the Comsat Act does not preclude subsequent Government action to authorize commercial domestic communications satellite systems.

It might nevertheless be argued that while section 102(d) preserves Congress' right to authorize additional satellite systems, Congress did not intend to permit such systems to be set up in the absence of new legislation.

No provision of the Comsat Act explicitly deprives the FCC of its preexisting authority to license operators of domestic satellite communications systems. The legislative history is not entirely clear, but this is understandable, since, as we have previously pointed out, the establishment of any additional commercial system was considered extremely unlikely in the foreseeable future. Thus, most of the discussion of the Church amendment was directed at the possibility of the Government establishing another system. (This amendment added the words "or if otherwise required in the national interest" to section 201(a)(6) in order to conform that provision to section 102(d).) Senator Church was asked by Senator Douglas whether his amendment would authorize the establishment of additional systems or whether further legislation would be necessary. Senator Church's reply was that "it would depend on the circumstances. It might be necessary to come back for additional authorization. It might not, depending upon the type of system proposed." 108 Cong. Rec. 16364. The general sense of the debate on this point was that while it was expected that creation of a satellite communications system by the Government would probably require legislation, at least appropriations, it was not the intent of the Comsat Act to impose a requirement for such legislation. In other words, preexisting authority to establish such systems was left unchanged.

Additional support for this conclusion may be found in the history of section 102(d). In the Comsat bill as reported from the House Commerce Committee section 102(d) read as follows:

"It is not the intent of Congress by this Act to preclude the creation of additional communications satellite systems, if required to meet unique governmental needs or if otherwise required in the national interest."

This section was amended on the floor on the motion of Congressman Harris to provide:

"The Congress reserves to itself the right to provide for additional communications satellite systems if required to meet unique governmental needs or if otherwise required in the national interest."

In the Senate this provision was put in its present form. While it is by no means clear that what Congressman Harris had in mind was to provide that additional systems could be created only by legislation,^{4/} or that the Senate's purpose in changing the language back again was to rebut such an implication, it seems a reasonable inference that section 102(d) was intended to leave existing law and existing authority unchanged.^{5/}

Therefore, it is our view that the Comsat Act does not preclude the FCC from authorizing the construction and operation of a domestic communications satellite system pursuant to its authority under the Communications Act of 1934.

Authority of Comsat

The question of Comsat's authority to supply domestic communications services really breaks down into two parts. May Comsat supply such services as part of the satellite

^{4/} His explanation of his amendment was that "we should take a positive rather than a negative approach." 108 Cong. Rec. 7523.

^{5/} It might also be argued that to interpret section 102(d) as merely preserving the Government's right to establish or authorize additional systems under new legislation would deprive that provision of any effect, since Congress in section 301 reserves the right to repeal, alter or amend any part of the act. However, it does not seem particularly improbable that Congress would desire to emphasize the nonexclusive nature of Comsat's authority, even at the risk of being redundant.

system authorized by the Comsat Act? May Comsat supply such services as part of a separate system authorized under the Communications Act of 1934?

Section 305(a) of the Comsat Act, 47 U.S.C. 735(a), authorizes Comsat to operate "a commercial communications satellite system." The use of the singular form to describe Comsat's operation is consistent throughout the act and appears to be deliberate, particularly in the light of section 102(d), which refers to both the use of the Comsat system for domestic services and the possible creation of additional systems. The powers of Comsat, as set forth in Article III of its articles of incorporation, are all to be exercised "to further and carry out the purposes and achieve the objectives of the Satellite Act," and these powers relate to the operation of a "commercial communications satellite system." Comsat does not, in our view, have the general powers possessed by ordinary business corporations, but only such powers as are authorized by the Comsat Act, under which it was organized. Thus, we doubt that Comsat has corporate capacity to operate a communications satellite system other than the system provided for in the Comsat Act.

But this is not to say that Comsat may not furnish domestic services. Indeed, section 102(d) specifically contemplates the possibility that the Comsat system may be used for domestic communication services. It appears, therefore, that there is some legal significance attached to the distinction between furnishing domestic service as part of the Comsat system and furnishing such service under a separate system.

However, it is not at all clear from the Comsat Act what the factual basis for the distinction is. While "communications satellite system" is a defined term (§ 103(1)), the definition is not helpful in determining when a part of the main system is sufficiently distinct to be considered a separate system. Indeed, when it is recalled that the framers of the legislation doubted the feasibility of other commercial communications satellite systems in the foreseeable future, and that the section 102(d) reference to additional systems was largely intended to provide for unforeseen possibilities,^{6/} it seems likely that the distinction

^{6/} See note 3, supra.

between the Comsat system and other systems lies not in their physical or technological integrity, but simply in the authority under which they are established. On this reading, then, whatever Comsat operates is the Comsat system, and the fact that Comsat has no authority to operate a domestic system under the Communications Act would have no real significance.

We suggest this last merely as a hypothesis. We are, as you know, quite unfamiliar with the technological aspects of this problem and do not believe that we can determine at this time where the line is to be drawn between the Comsat system and additional systems. We conclude merely that Comsat appears to be authorized to furnish domestic services within its system, as that system is defined and authorized by the Comsat Act; we doubt Comsat's authority to furnish such services under the Communications Act.

This brings us to the "conflict of interest" problem you suggest in paragraph 2(b). We assume that what you have in mind is that if Comsat enters domestic service, it would probably or necessarily be competing with the terrestrial systems of those common carriers who are holders of Comsat's Class II common stock and under section 303(a) of the Comsat Act are entitled to elect six of the fifteen members of Comsat's board of directors.

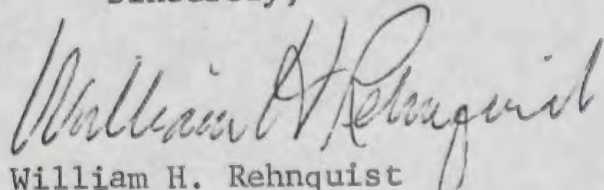
Such a conflict of interest situation would presumably create certain practical problems, but present statutes appear to give the FCC adequate power to deal with them. Section 401 of the Comsat Act, 47 U.S.C. 741, declares that Comsat is a common carrier within the meaning of the Communications Act of 1934. As such, Comsat is presently subject to section 212 of the Communications Act, which provides that no person may hold the position of officer or director of more than one carrier subject to the Communications Act without the approval of the Commission. Sections 8 and 10 of the Clayton Act, 15 U.S.C. 19, 20, also contain certain prohibitions against interlocking directorates, which are enforced, in the case of communications common carriers, by the FCC, 15 U.S.C. 21(a). Furthermore, under the Comsat Act, § 304(b), (f), the FCC has authority to approve the ownership of Comsat

stock by particular carriers and to require the transfer of stock from one carrier to another. Thus, the FCC has ample statutory authority to deal with whatever conflict of interest situations might arise from Comsat's entry into domestic service.

Of course, the competitive impact of Comsat's domestic service might conceivably be such as to make it impossible to avoid a conflict of interest situation while retaining the present level of carrier investment in Comsat, but we are unable to comment on the likelihood of such a situation or what measures might be taken to deal with it.

We have examined the draft memorandum of December 20. We are not sufficiently familiar with the subject matter to comment on the policy considerations involved or on the legal questions except to the extent that we have done so above.

Sincerely,

A handwritten signature in dark ink, appearing to read "William H. Rehnquist". The signature is fluid and cursive, with the first name "William" and last name "Rehnquist" clearly distinguishable.

William H. Rehnquist
Assistant Attorney General
Office of Legal Counsel

Department of Justice
Washington, D.C. 20530

Dr. Clay T. Whitehead
Staff Assistant
Office of the President
The White House
Washington, D. C.

DEC 18 1969

Dear Dr. Whitehead:

The Office of Legal Counsel has asked that the Antitrust Division respond to three of the legal questions on domestic satellites contained in your letter of November 3, 1969 to Mr. Rehnquist. These are question 9 (relating to interconnection), question 10 (concerning access for competitors to a network-controlled satellite), and question 11 (concerning noncompensatory pricing). Question 10 is primarily one of antitrust policy, while question 11 has some antitrust issues; on the other hand, question 9 (which does raise some competitive issues) is basically a question arising under the Communications Act of 1934, and therefore we can claim no particular expertise with respect to it.

We understand that the Office of Legal Counsel will respond to the remaining questions in your letter.

9. Interconnection

Under the 1934 Act (or the 1962 Act, if applicable), does the FCC have jurisdiction and authority to (a) regulate the terms of leasing and interconnection arrangements between an existing communications common carrier and either a communications common carrier utilizing satellites or a non-common carrier utilizing satellites; or (b) require that an existing communications common carrier furnish facilities sought by a communications common carrier utilizing satellites or a non-common carrier utilizing satellites?

(a) Interconnection with common carrier systems.
At common law, clearly one common carrier could not be required to link or connect its facilities with those of another, and as an obvious corollary had no compellable obligation to furnish another common carrier facilities. 1/ Section 201(a) of the Communications Act of 1934 (47 U.S.C. §201(a)) purported to change this. That section imposed first, a duty upon the communications common carrier to furnish service upon reasonable request. 2/ Additionally, the plain language of the section granted the Commission power to compel a carrier "to establish physical connections with other carriers, to establish through routes and charges, and to establish and provide facilities and regulations for operating such through routes."

The Commission, however, has placed a somewhat restrictive gloss on this statutory provision. When a carrier interconnects by leasing plant and facilities to another so that the second carrier may provide a particular service or facility to its customers, the terms applicable to the transaction are usually set forth in a contract between the carriers. The Commission has taken the position that it has no general authority to modify, rescind, or in any other manner, regulate the terms of these contracts or require that one carrier furnish the facilities sought by another carrier 3/, because "...

1/ See, e.g., Atchison, Topeka & Santa Fe R.R. Co. v. Denver & New Orleans R.R. Co., 110 U.S. 667, 680 (1884); State v. Northwestern Bell Teleph. Co., 214 Iowa 1100, 240 N.W. 252 (1932); Home Teleph. Co. v. Peoples Teleph. & Teleg. Co., 125 Tenn. 270, 141 S.W. 845 (1911).

2/ See, e.g., Coastal Auto Parts, Inc., F.C.C. Dkt. No. 18706, Memorandum Opinion and Order, October 27, 1969.

3/ It should be noted that the 1956 antitrust consent decree entered against AT&T imposed the obligation upon the Bell System to furnish leased facilities to Western Union. United States v. Western Electric, CCH 1956 Trade Cases ¶68,246 (S.D.N.Y. 1956), para. XVII(c).

the provision of facilities by one common carrier to another common carrier has not been regarded as a common carrier undertaking." 4/

To remedy this lapse, the Commission has asked Congress to make the provision of facilities by one carrier to another carrier a matter of explicit regulatory jurisdiction fully subject to Title II of the 1934 Act. Furthermore, the Commission has requested authority to require this service if the public convenience and necessity would be served.

The authority being sought in the bill is . . . needed in order to avoid situations where there would have to be wasteful duplication of facilities in order to provide the needed service. 5/

No such general bill, however, has yet been successful.

However, when Congress enacted the Comsat Act, a provision granting this authority to the FCC was included. 6/ Hence, the Commission presently has explicit authority to compel terrestrial common carriers to furnish interconnection facilities to Comsat, and to supervise the terms and conditions of the necessary intercarrier contracts.

Despite inclusion of such specific authority as to Comsat, it is still highly probable that the above-quoted language of Section 201(a) of the 1934 Act authorizes the Commission to regulate and supervise common carrier

4/ Senate Report No. 1584, 87th Cong., 2d Sess. 17 (1962). Compare Western Union, F.C.C. Dkt. 8963, 5 P. & F. Radio Reg. 639, 659 (1951) (TV Interconnection case).

5/ Hearings Before the House Interstate and Foreign Commerce Committee, 88th Cong., 2d Sess. 10 (1964).

6/ 47 U.S.C.A. §721(c) (1962).

interconnections even when they involve provision of facilities. Thus, interconnection could be ordered with a domestic satellite communications common carrier, whether operated by Comsat or not.

First, the statutory language fairly plainly indicates that such explicit authority already exists, and the Commission's past requests for clarifying legislation are not dispositive. 7/ Second, as a general rule, restrictions administratively engrafted onto basic agency jurisdictional statutes are disfavored, 8/ and prior agency policy rarely conclusive. 9/ Third, regulation and indeed, compulsion, of intercarrier connection agreements are reasonably ancillary to the regulation of the participating common carriers, and often necessary to effect the purposes of the 1934 Act. Finally, the Commission itself seems to have recently abandoned its previous positions; in its August 1969 Microwave Communications, Inc. decision, the Commission ordered interconnection through provision of facilities, stating:

We have already concluded that a grant of MCI's proposal is in the public interest. We likewise conclude that, absent a showing that interconnection is not technically feasible, the issuance of an order requiring the existing carriers to provide loop service is in the public interest. 10/

7/ See United States v. Southwestern Cable Co., 392 U.S. 157, 170-78 (1968); American Trucking Assoc. v. Atchison, Topeka & Santa Fe R.R. Co., 387 U.S. 397, 418 (1967).

8/ See Social Security Bd. v. Nierotko, 327 U.S. 358 (1945).

9/ See FCC v. American Broadcasting Co., 347 U.S. 284 (1954); Skidmore v. Swift & Co., 323 U.S. 134 (1944).

10/ Microwave Communications Inc., 16 P. & F. Radio Reg. 2d 1037 (1969).

(b) Interconnection with non-common carrier systems. There is apparently no clear FCC decision on the question whether a communications common carrier must interconnect with a communications non-common carrier.

"'Private systems' service is in the 'gray' area between [common carrier] and non [common carrier] service." 11/ Most state courts and state utilities commissions have generally upheld telephone companies when they have refused to interconnect with other private or semi-private communications systems. 12/ This refusal has been most consistent where the private system was offering a communications service closely approximating or interchangeable with a service provided by the telephone company. 13/ The usual rationale has been that compelling such interconnection would somehow invade the telephone company's property rights or lawful franchise.

The FCC has concluded that the provisions of Title II of the 1934 Act are "generally pertinent, since the operator [of a private system] is in the position of a customer or user". 14/ Section 201(a) of the 1934 Act states that "it shall be the duty of every common carrier engaged in interstate or foreign communication by wire or radio to furnish communication service upon reasonable request therefor. . ."

11/ Mid-America Teleph. Co. v. Ohio Bell Teleph. Co.,
40 P.U.R. 3d 244, 251 (Ohio Pub. Util. Comm'n 1961).

12/ See generally, In re Southwestern Bell Teleph. Co.,
10 P.U.R. 3d 476 (Mo. 1955); Re New York Teleph. Co., 45
P.U.R. (NS) 409 (N.Y. 1942); Building Indust. Exhibits
v. Cincinnati & Suburban Bell Teleph. Co., 71 P.U.R. (NS)
74 (Ohio 1947); Ohmes v. General Teleph. of S. W., 384
S.W. 2d 796, 799 (Texas Civ. Apps. 1964). See also Annot.,
Right and Duty of Telephone Companies to Make or Discontinue
Physical Connection of Exchanges or Lines, 76 A.L.R.
953 (1932).

13/ See, e.g., State ex rel. Util. Comm'n v. Two-Way
Radio Service, 272 N.C. 591, 158 S.E. 2d 855 (1968).

14/ Western Union, 5 P.&F. Radio Reg. 639, 660 (1950).

The Supreme Court has stated:

We do not think it is necessary in determining the application of a regulatory statute to attempt to fit the relationship into some common-law category. It is sufficient to say that the relation is one which the statute contemplates shall be governed by reasonable regulations initiated by the telephone company but subject to the approval and review of the Federal Communications Commission. 15/

In a related area, the Supreme Court has held under the Interstate Commerce Act that the obligation of a railroad common carrier to provide service upon reasonable request embraces a duty to provide service to other systems (in the case, trucking company piggyback operations), notwithstanding that such "person tendering traffic is a competitor. . . ." 16/ Although the trucking companies were common carriers, that fact apparently played little part in the court's decision.

Hence it is probable that within accepted common carrier precepts, the FCC has the authority to compel a communications common carrier to interconnect with private communications systems upon reasonable request therefor. Given the fact that the Domestic Satellite Service will probably be deemed interstate commerce, such authority should certainly suffice.

10. Access to Network-owned Satellite

If the three major television networks form a joint venture for domestic broadcast distribution through satellites, what would be the obligation of such a joint venture to supply satellite channels to others in the trade--including either a fourth network or a CATV network, or for one-time broadcasts--assuming (a) that excess system capacity exists or (b) that system capacity is fully utilized by the joint venture participants?

15/ Ambassador, Inc. v. United States, 325 U.S. 317, 326 (1945).

16/ American Trucking Assoc. v. Atchison, Topeka & Santa Fe R.R. Co., 387 U.S. 397, 407 (1967).

The question of access to an existing joint venture presupposes the affirmative resolution of an important initial inquiry in antitrust joint venture analysis;-- Is the establishment of the jointly-sponsored facility justified under the circumstances, or should creation of such facilities be left to the efforts of individual competitors? Joint business ventures, planned and operated by normally competing entities, are uniquely susceptible to misuse which adversely affects competition. They may eliminate or dampen actual or potential competition between their sponsors or with others. Also, if a joint venture is technically or otherwise necessary, it may still be unduly anticompetitive if the facility is competitively significant and competitors of the joint venturers are denied fair access to it.

A joint venture may be necessary if the facility is to be created at all. The facility or system may be intrinsically unitary on account of economies of scale, or for other structural reasons. In addition, a joint venture among competing entities may be acceptable or desirable where--because of limited demand factors, developing and volatile technologies, and massive costs of formation--individual initiative at a given time simply will not provide the facility or system which is desirable or even essential. This sort of analysis would appear to justify the use of a joint venture approach for broadcast distribution by domestic satellites at this stage in satellite development.

However, future circumstances may not justify such a joint venture approach as to future systems. Conditions that now prevail may well change, so that the type of joint venture now contemplated will have to be reassessed as subsequent broadcast satellite systems are proposed.

If a joint venture is appropriate, it must be established and operated in a fashion that affords fair opportunity for access or participation by those in the trade (including at least broadcasters and CATV operators). The problems of such participation or access are, however, somewhat different depending on whether one assumes excess capacity in the system.

(a) The Excess Capacity Situation. Here, it is assumed that the three major television networks propose to form a joint venture for domestic broadcast distribution through satellite(s) and the necessary related earth components. The legal form of the joint venture is not analytically important, but is assumed to be a separate corporation, with stock ownership and control divided among the joint venture participants in proportion to their capital subscriptions. It is here assumed that the space segment of the broadcast system consists of at least one satellite with a given channel capacity (e.g., a satellite dedicated to video broadcasting with a broadcast capacity of 24 video channels), and that the earth segment of the system consists of ground stations owned by the joint venture, by individual networks, or by local network affiliates. It is also here assumed that sufficient system capacity always exists to satisfy the requirements of the networks and anyone else desiring to participate. It is recognized that, depending upon demand for channels, this excess capacity situation - either on the satellite or the ground stations - might or might not exist or continue. The question here is whether, and on what terms, the joint venturers would have an obligation to make excess channel capacity available to other broadcasters.

Antitrust generally prohibits competitors in a given market from combining to exclude other actual or potential competitors from that market - a principle specifically applicable to joint business ventures formed by competitors. Associated Press v. United States, 326 U.S. 1 (1945). However, when that joint arrangement is itself legal, either because it is a natural monopoly or otherwise, then another antitrust rule comes into play: This requires a group of competitors controlling an essential resource or facility to provide access to it, on equal and nondiscriminatory terms, to all those who compete in the trade. United States v. Terminal R.R. Association, 224 U.S. 383 (1912); Associated Press v. United States, 326 U.S. 1 (1945). 17/ The reason

17/ This principle of equal and nondiscriminatory access to an essential resource or facility controlled by some, but not all, competitors in a given field, has been applied often to require access to markets or exchanges where such access is a prerequisite to effective competition. Gamco, Inc. v. Providence Fruit and Produce Bldg., 194 F. 2d 484 (1st Cir. 1952), certiorari denied, 344 U.S. 817 (1952) (a produce exchange building); American Federation of Tobacco Growers v. Neal, 183 F. 2d 869 (4th Cir. 1950) (a tobacco market); United States v. New England Fish Exchange, 258 Fed. 732 (D.Mass. 1919) (a fish market); and United States v. Tarpon Sponge Exchange, 142 F.2d 125 (5th Cir. 1944) (a sponge market).

for the rule is to prevent control of the resource from being used to suppress competition in markets in which the joint ventures operate. In its 1963 opinion in Silver v. New York Stock Exchange, 373 U.S. 341, a situation involving denial of private wire communications access to the nation's major securities exchange, the Supreme Court observed in a footnote that:

A valuable service germane to petitioner's business and important to their effective competition with others was withheld from them by collective action. That is enough to create a violation of the Sherman Act. 18/

It appears that significant economies are likely to result from the use of a domestic satellite system for television broadcast distribution. This means that the satellite system would be an essential resource to those engaged in offering television programming to the public, either over the air or via cable. Accordingly, antitrust would require that non-discriminatory access to system capacity be made available to competing networks, video broadcasters and CATV operators. Such access would be provided to all on the same or equivalent terms (whether for continuous channel capacity or off-peak capacity). 19/

In making excess satellite capacity available to competing networks, video broadcasters and CATV operators, the joint venturers should be able to require (i) pro-rata investment or (ii) payment of a usage fee, based on the joint venturer's own per channel average costs of usage. Seemingly, such a system investment or usage fee should be based on current operating expenses and a reasonable capital charge reflecting the system's remaining estimated useful life. The mechanical process of arriving at a fair system investment or usage fee for each new user, although perhaps complex, should be designed with the goal of preventing any undue competitive advantage for existing users.

18/ Footnote 5, 373 U.S. 348-349, at 349. In articulating this antitrust principle, the Court cited Associated Press, Terminal R.R. Association, and other antitrust authorities.

19/ Of the antitrust cases establishing the principle of fair access to joint venture facilities and systems, United States v. Terminal Railroad, supra, is particularly clear on this point.

(b) The Limited Capacity Situation. In limited capacity situations, fair participation is still required. However, the process of determining fair access becomes more complex. In Gamco, Inc. v. Providence Fruit & Produce Bldg., supra, for example, the court dealt with a situation in which the access problem involved the right to lease space in a produce market building which had limited capacity. In formulating its remedy for the plaintiff, found to have been wrongfully excluded from its rental space, the court declared that (at 194 F. 2d 489):

Upon remand the district court will proceed to ascertain and award the damages and appropriate counsel fees and further to determine as a court of equity the extent to which equitable relief should be awarded. In this it should be guided by the aim to restore plaintiff to its former competitive position so far as this can be done without taking away rights from innocent third persons. Thus the plaintiff should be accorded space in the building on terms similar to those accorded others, at once if available without dispossessing such innocent parties, otherwise as soon as available.

19/ footnote continued

There, at 224 U.S. 411, in discussing access to a joint railroad terminal facility, the Court stated that the joint venture could remedy its Sherman Act access problems by:

First. By providing for the admission of any existing or future railroad to joint ownership and control of the combined terminal properties, upon such just and reasonable terms as shall place such applying company upon a plane of equality in respect of benefits and burdens with the present proprietary companies.

Second. Such plan of reorganization must also provide definitely for the use of the terminal facilities by any other railroad not electing to become a joint owner, upon such just and reasonable terms and regulations as will, in respect of use, character and cost of service, place every such company upon as nearly an equal plane as may be with respect to expenses and charges as that occupied by the proprietary companies.

It seems obviously sound that the one-time user, as a general principle of fair access, should be junior to the more continuous users, whether the original joint venturers or the later participants which pay (or wish to pay) for continuous channel capacity. While the one-time user should have a call upon idle channels, or off-peak periods on allocated channels, it should have no right to claim access to continuously-occupied capacity, other than that which might be bargained for commercially.

Another question of priorities caused by limited capacity would involve the competing claims of later arriving continuous-users who seek access to already occupied channels after establishment of the joint satellite facility. If later claimants were to have the open-ended right to channel space already occupied, the joint venture might well never be created; such a result would of course adversely affect competition and rates for broadcast distribution - a field now entirely controlled by A.T.&T. Therefore, in view of the present uncertainty of investment in the new field and the anticompetitive result from the project not going forward, we conclude that subsequent access should not be required provided (1) the sponsors of the joint venture had originally given notice to all over-the-air and CATV broadcasters and had given them a reasonable opportunity to participate on equal terms in the proposed satellite facilities; (2) in establishing the satellite system, the sponsors had not unjustifiably limited the system's capacity for the purpose of protecting their positions against the inroads of other broadcast competition; and (3) no usage of channel capacity could be shown as designed to preempt later use by newcomers.

With respect to initial establishment of the limited capacity system, antitrust would seek to assure the broadest possible initial participation by all existing or potential competitors who may desire use of the facility. Assuming that a system with a given capacity is contemplated, the sponsors should give appropriate notice about the impending joint venture (i.e., its channel capacity, broadcast capabilities, expense, etc.) to all other networks, broadcasters, and CATV operators which might logically desire participation. Then, such potential users should be allowed to subscribe to the venture on fair, pro-rata terms, and to assure themselves of some full channel capacity. If other users wish to subscribe to some channel

capacity at the outset, they cannot be precluded from doing so simply because the capacity proposed in the initial system approximates the projected initial broadcast demand of the sponsors; in other words, the sponsors would have to cut back their demands, expand the satellite, or go ahead with a second one. If initial demand for satellite channels would exceed the level of capacity that would produce the lowest per-channel cost of capacity, the use of somewhat greater capacity and perhaps more expensive hardware might be required, and it would have to be shared among all users.

The foregoing procedure would have to be repeated as each new broadcast distribution satellite was established by the joint venture. Thus, any broadcasters or CATV operators who did not join the initial satellite might be given an equal opportunity to participate in subsequent satellites.

Finally, if some space in the satellite is not already occupied, it should be allocated to newcomers on a first come, first served basis. If applications are essentially simultaneous, the unoccupied space should be fairly allocated on a basis similar to that employed during the initial establishment of the facility.

The procedure outlined above would, we believe, satisfy the antitrust access requirements established in the St. Louis Terminal and Associated Press cases. It would appear to be more applicable to the space segment than the ground stations, where new increments of capacity can apparently be added to serve additional users.

11. Non-compensatory Pricing.

- (a) What Communications Act and antitrust procedures exist to prevent non-compensatory pricing by existing terrestrial broadcast distributors (principally, such as AT&T) designed to forestall the effective development of a competing broadcast distribution system utilizing satellites?
- (b) Is the answer different if the "non-compensatory" pricing is below "average" cost but not "marginal" cost?

(a) Non-compensatory Pricing Generally. Sections 201(b) and 202(a) of the Communications Act (47 U.S.C. §§ 201(b), 202(a)) require common carriers to maintain "just and reasonable" charges for communications services and make illegal "any unjust or unreasonable discrimination in charges, practices," etc. for any services. Under these sections the Commission would appear to have ample authority to prevent non-compensatory pricing by existing common carriers, such as AT&T, which was designed to forestall development of a competing broadcast distribution system utilizing satellites.

A "just and reasonable" rate for a particular service has been held to be one that covers expenses and provides a fair return on invested capital. Wilson & Co. v. United States, 335 F. 2d 788, 797-98 (7th Cir. 1964), remanded on other grounds, 382 U.S. 454 (1966). While the "value of service" to users concept may be utilized in determining what constitutes a reasonable rate of return (*ibid.*), a rate which was non-compensatory probably would be unreasonable under most circumstances.

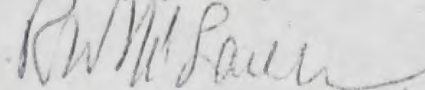
The antitrust laws are also relevant to the issue of non-compensatory pricing. Section 2 of the Sherman Act (15 U.S.C. §2) makes it illegal to "monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce" of the United States. This provision generally prevents even a legal monopolist from reducing its prices below cost to forestall successful entry by a new competitor who has not also priced below long run cost or otherwise engaged in competitive unfairness. See, e.g., Union Leader Corp. v. Newspapers of New England Inc., 284 F. 2d 582 (1st Cir. 1960). Non-compensatory pricing may not be illegal in all other instances. See Turner, "Conglomerate Mergers and Section 7 of the Clayton Act", 78 Harv. L. Rev. 1313, 1340-41. However, when a monopolist intends to forestall new competition rather than simply to recoup a portion of invested capital or to prevent even greater losses, non-compensatory pricing may be unlawfully exclusionary. See, e.g., Standard Oil Co. v. United States, 221 U.S. 1, 43, 76 (1911); United States v. New York Great Atlantic & Pacific Tea Co., 173 F. 2d 78, 88 (7th Cir. 1949); United States v. United Shoe Machinery Corp., 110 F. Supp. 295, 325-29, 346 (D. Mass. 1953).

(b) Marginal Cost Pricing. It has been argued frequently that selling at marginal rather than average cost should be permitted by regulatory agencies. See Turner, "The Scope of Antitrust and Other Economic Regulatory Policies", 82 Harv. L. Rev. 1207, 1233, n. 49. Regardless of the merits of this position as a general rule, there should be little doubt that a regulatory agency should not permit pricing below average (but not marginal) costs if the effect is to forestall introduction of important new communications technology and competitive benefits. In such circumstances, pricing below average cost would be unjust, unreasonable or discriminatory under Sections 201(b) and 202(a) of the Act. This should be the case even if the justification is that the below average cost pricing is necessary to recoup fixed costs for investments which would become obsolete if a new system were developed. (Once the new competing system has come into regular service, a different situation may apply; at that time, the prior monopolist might be required by the marketplace to reduce its prices below even marginal cost because its technology has been rendered obsolete by the new system.) 20/

20/ This type of situation might exist with respect to international undersea cables, if the Authorized User Decision, 4 F.C.C. 2d 421 (1966), did not prevent satellite-based prices from being offered directly to users.

Under the antitrust laws, introduction of marginal cost pricing by a monopolist is probably illegal if done only because of anticipation of entry by a specific new competitor, directed toward that specific company, and done with the intent of preventing such entry by the company. Introduction of selective below average cost pricing for an established specific service would probably prove these elements.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "R. W. McLaren", written in a cursive style.

RICHARD W. McLAREN
Assistant Attorney General
Antitrust Division

Comment

THE WHITE HOUSE
WASHINGTON

November 7, 1969

MEMORANDUM FOR

Mr. William H. Rehnquist
Assistant Attorney General
Office of Legal Counsel
Department of Justice

In connection with the White House consideration of the domestic satellite issue now pending before the Federal Communications Commission (FCC), we request your consideration of the following questions relating to the Communications Act of 1934 (the 1934 Act), the Communications Satellite Act of 1962 (the 1962 Act), and the antitrust laws. We understand that you may, in your consideration of the questions below, wish to consult with other divisions of the Justice Department or with the Federal Communications Commission for their views. Would you please advise us if, for any reason, you feel unable to provide helpful comment on any of the questions posed below.

1. Applicability of the 1962 Act.

(a) Does the 1962 Act govern, in whole or part, the FCC's authority to authorize a domestic communications satellite? (b) If so, does the 1962 Act establish Comsat as the sole entity authorized to construct and operate privately owned communications satellite facilities for domestic use? (c) Does the 1962 Act otherwise preclude the FCC from authorizing the construction and operation of satellite facilities or ground stations for domestic services by either common carriers or non-common carriers other than Comsat?

2. Comsat.

(a) Does Comsat's charter under the 1962 Act provide sufficient authority for it to supply domestic communications services outside the Intelsat system authorized by the 1962 Act under the more general authority of the 1934 Act? (b) If so, would Comsat's competitive entry into the domestic field cause a conflict of interest situation due to carrier representation on its Board? Would this violate either the 1934 Act or the antitrust law?

3. Minimum Regulation.

What is the minimum degree of FCC regulation over a communications system utilizing satellites now required by the 1934 Act (and the 1962 Act if applicable)?

4. Non-Common Carriers.

(a) Has the Federal Communications Commission power to treat any privately owned communications system utilizing satellites as a non-common carrier? (b) What are the consequences of doing so?

5. Impact on Carriers' Services.

(a) In allocating spectrum to non-carrier satellites, must the FCC consider the economic impact of a non-carrier's proposed use on services now offered by a common carrier?

6. Impact on Future Carrier Spectrum Needs.

(a) In allocating spectrum to non-common carrier satellites, must the FCC consider potential common carrier demands for the requested frequencies? (b) If so, what is the standard for measuring carriers' potential needs?

7. Interference.

(a) Does its authority over radio frequency allocations or its general supervisory powers over communications common carriers under the 1934 Act enable the Federal Communications Commission to modify, rescind, or otherwise regulate outstanding domestic point-to-point microwave radio service licenses and construction permits so as to minimize potential radio signal interference among such microwave systems and earth stations employed in providing communications services through satellites? (b) If the Federal Communications Commission has such authority, may it, upon its own initiative or upon application of the satellite operator, compel the locational modification of outstanding domestic point-to-point microwave radio service licenses and construction permits?

(c) Is the exercise of such authority contingent upon provisions of adequate compensation of the affected carrier, and, if so, upon whom does the obligation to provide such compensation rest?

8. Spectrum Allocation.

Does the FCC have sufficient authority either (a) to deny one spectrum applicant's license in favor of another when it can be shown the first can use cable with equal facility while the second cannot; or (b) to rescind licenses under the same conditions?

9. Interconnection.

Under the 1934 Act (or the 1962 Act, if applicable), does the FCC have jurisdiction and authority to (a) regulate the terms of leases and interconnection arrangements between an existing communications common carrier and either a communications common carrier utilizing satellites or a non-common carrier utilizing satellites; or (b) require that an existing communications common carrier furnish facilities sought by a communications common carrier utilizing satellites or a non-common carrier utilizing satellites?

10. Access to Network-owned Satellite.

If the three major television networks form a joint venture for domestic broadcast distribution through satellites, what would be the obligation of such a joint venture to supply satellite channels to others in the trade--including either a fourth network or a CATV network, or for one-time broadcasts--assuming (a) that excess system capacity exists or (b) that system capacity is fully utilized by the joint venture participants?

11. Non-Compensatory Pricing.

(a) What Communications Act and antitrust procedures exist to prevent non-compensatory pricing by existing terrestrial broadcast distributors (principally, such as AT&T) designed to forestall the effective development of a competing broadcast distribution system utilizing satellites? (b) Is the answer different if the "non-compensatory" pricing is below "average" cost but not "marginal" cost?

Clay T. Whitehead
Staff Assistant

cc: Mr. Flanigan
Mr. Whitehead ✓
Mr. Kriegsman
Mr. Jon Rose
Central Files

DBaker(Justice)/CTWhitehead/JRose:ed

Comsat

Friday 10/24/69

10:15 Dr. Lyons called--make sure Tom sees Comsat News Digest,
October 21, Vol. 8, No. 3. Has whole press play on Domestic
Satelite as well as speculation about Telecommunications
Management in Government.