

AIR TRANSPORT ASSOCIATION

of America

Col. Olsen
Doyle.

1000 CONNECTICUT AVENUE, N.W. • WASHINGTON, D.C. 20036 • TELEPHONE 296-5800

VICE PRESIDENT
OF THE SENIOR VICE PRESIDENT
OPERATIONS AND AIRPORTS
CLIFTON F. VON KANN

January 13, 1971

Dr. George F. Mansur, Deputy Director -
Executive Office of the President
Office of Telecommunications Policy
Washington, D.C. 20504

Dear Dr. Mansur:

We appreciated the opportunity to briefly meet with you on January 6, 1971, to receive the Administration's policy position on satellite telecommunications. Naturally, we were disappointed to learn that the stated airline position to utilize the VHF spectrum for the operational system was not supported. However, it was gratifying to hear that the government plans to utilize commercial telecommunications facilities and services to the maximum extent feasible, and also to hear that the program would be assigned to DOT as the lead management agency.

Again, thank you and we will look forward to a continuing close relationship in seeking solutions to our joint problems.

Sincerely,

Clifton F. von Kann

Clifton F. von Kann

January 11, 1971

Weekly Activity Report Items

Memorandum for the Record

INTERNATIONAL/SATELLITE TELECOMMUNICATIONS

The Director and Deputy Director held a press conference on January 7 for the purpose of making an announcement of the Administration's policy on aeronautical satellite communications. A press release and an accompanying statement of government policy was made available to members of the press and others attending the press conference. Subsequently, the Director formally issued the statement of government policy to the Secretary of Transportation, the Secretary of State and the Acting Administrator of National Aeronautics and Space Administration.


W. T. Olsson

cc: Dr. Lyons
Mr. Doyle

REWRITTEN:DTW HITEHEAD:dc

Mr. Whitehead

Dr. Mansur Olsson: Subj RF

Honorable George M. Low

Acting Administrator

National Aeronautics and Space

Administration

Washington, D. C. 20546

Dear Mr. Low:

The Administration has completed a policy review on aeronautical telecommunications via satellites for international civil aviation. The Administration's position in this matter is contained in the attachment, "Statement of Government Policy on Satellite Telecommunications for International Civil Aviation Operations."

The Government policy provides a broad framework of objectives, technical and operational arrangements, management arrangements and economic arrangements to guide the Executive Branch agencies during the year ahead. Among other things, the policy affirms the lead management agency role of the Department of Transportation and establishes supporting roles for the Department of State and the National Aeronautics and Space Administration.

We believe the Government policy represents an effective approach to achieving the communications necessary for continued safety and improved efficiency of international air travel. We also believe that the United States has the opportunity to continue its leadership role in civil aviation by aggressive implementation of the enunciated policy. The National Aeronautics and Space Administration has an important role in supporting the implementation program.

We plan to supplement the policy statement in the near future with more specific program guidelines. Meanwhile, the attached policy statement will be used by the Executive Branch in reorienting its efforts in this field, including subsequent United States participation in international meetings.

I would like to express our appreciation for your agency's contributions to the policy review.

Sincerely,



Clay T. Whitehead

Encl.

OLSSON/Mansur:jm
Mr. Whitehead ✓
Dr. Mansur
Olsson

1/10/71

11 JAN 1971

*OLP -
Approved
Initials*

Honorable Dean Burch
Chairman
Federal Communications Commission
Washington, D. C. 20554

Dear Mr. Chairman:

The Administration has completed a policy review on aeronautical telecommunications via satellites for international civil aviation. The Administration's position in this matter is contained in the attachment, "Statement of Government Policy on Satellite Telecommunications for International Civil Aviation Operations."

The Government policy provides a broad framework of objectives, technical and operational arrangements, management arrangements and economic arrangements to guide the Executive Branch agencies during the year ahead. Among other things, the policy affirms the lead management agency role of the Department of Transportation and the supporting roles of the Department of State and the National Aeronautics and Space Administration.

We believe the Government policy represents an effective approach to achieving the communications necessary for continued safety and improved efficiency of international air travel. We also believe that the United States has the opportunity to continue its leadership role in civil aviation by aggressive implementation of the enunciated policy.

The policy establishes this Administration's intention to promote the use of commercial telecommunication facilities and services. The Commission will wish to develop a regulatory framework as plans for aeronautical communication services evolve. The Office of Telecommunications Policy will be pleased to work with you in implementing the policy.

Sincerely,



Clay T. Whitehead

Enclosure

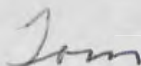
FROM THE DESK OF

WARD T. (TOM) OLSSON

January 8, 1971

Mr. Whitehead
Dr. Mansur
Mr. Doyle

The attached paper is for your information.
Note Mr. Montgomery's comments on pages
2 and 3 re NASA representative.



Tom

Encl.



Date: January 8, 1971

OTP Aeronautical
satellite
briefing

To: Matt Gordon

From: Hale Montgomery

Subject: OTP Press Briefing on Aeronautical Satellite

Doctors Whitehead and Mansur held a 2 p.m. press briefing on January 7 at the OTP Offices concerning their policy statement on aeronautical satellite communications. A pretty fair turnout of about one dozen or more Washington newsmen showed up, including representatives that I could recognize from the New York Times, Washington Post, Washington Star, Telecommunications Reports, AP (2 men) and UPI.

Dr. Whitehead opened the briefing with a few general comments then turned it over to Dr. Mansur. The following is a summary in chronological order of Mansur's remarks and some of the Question-Answer dialogue:

Dr. Mansur said that aviation traffic was expected to grow on the order of two to four times present volume within the next ten years, both domestically and internationally. He said HF radio cannot handle future needs, that there was an almost unanimous feeling that satellites are the only answer.

Looking at it from a more lofty view, Dr. Whitehead characterized the proposed satellite program for aviation as "really the second major application of satellite communication for peaceful purposes"; the first being INTELSAT. He said the policy they were enunciating was for a system open to the use of airlines and aviation users of all nations, not just the U. S.

Q & A

Asked if the overseas aeronautical satellite system being proposed tied into the proposed domestic U. S. satellite communication system in any way, Mansur answered affirmatively. He said the two systems would have to interface at gateways, and he conceded there may arise system design problems. He also pointed out that a separate satellite system may be used for domestic aeronautical purposes in the future, which would mean even more critical interfacing of differing systems.

Mansur said that the Pacific area was chosen first because there was a need to develop communications earlier in that area; also, the U. S. has central responsibility in the Pacific area, whereas the U.K. and Canada do in the Atlantic.

In response to an inquiry about operational dates, Mansur said that he expected the system, Pacific and Atlantic, to be on an operational basis by 1980, that is, mandatory for use by all rather than voluntary as would be the 1973 and 1975 pre-operational system.

*Asked about NASA's role, he merely responded that the policy did not alter their role significantly, that NASA would play an important part in the experimental (preop) period and that he expected the FAA to rely heavily on NASA counsel.

Asked how the airlines felt about going to UHF, Mansur said they had a "mixed reaction." He gave the impression that over the long term, because of advantages for the future, he felt the airlines would not oppose the UHF policy decision. (A newsman told me that ATA told him they could live with it, that it was at least a start on a firm program.)

Mansur explained that it would be a dedicated system that may evolve into a multi-user system in the future. By that, he said perhaps the maritime industry might use it as well as aviation. In answer to another question, Mansur said that the COMSAT hybrid plan was the only proposal that he knew of that had been made. Asked repeatedly about a Boeing proposal, Mansur insisted he knew of no such plan.

*Asked whether the FAA would own the ground stations, Mansur said FAA could either lease them from a commercial entity or build the ground stations themselves. He emphasized that this was a detail they had not decided in such a broad policy statement; that such a question would be settled by FAA as program leader later.

*Queried as to whether COMSAT under its present charter could provide positioning services, Mansur bowed out, and Dr. Whitehead fielded the question. Whitehead said that COMSAT probably could do this, that positioning was basically a communications service, but he acknowledged that there could be legal or technical problems concerned that he couldn't recognize at this time.

There were a host of questions about costs and repeated questions about participation of other countries in the program. In sum, Mansur said that there was strong support in the international community for UHF and that they anticipated that foreign countries would participate by both bidding on the hardware and leasing capacity. On costs he said the only general figures he knew of were those proposed by COMSAT of \$20 million annually for one ocean service.

(By passing up a note later we were able to have him correct this to \$19.1 million for two-ocean service.) Significantly, Mansur also said that two satellites would be needed in each ocean for redundancy.

As to whether the system would be an all-U.S. one, Dr. Whitehead said he presumed that bids would be invited from foreign countries also.

On the subject of leasing the services from a commercial entity, perhaps the language in the press release which accompanied the policy statement clarifies that issue better than anything:

Government use of commercial communications facilities and services helps to lower costs and agrees with the Administration's policy of encouraging the vitality of the private sector in developing and providing communication services. This policy envisages that the FAA will contract for services on a lease basis in contrast to government procurement and ownership of systems.



*It is generally believed that the person who asked these questions was a NASA representative and not a legitimate member of the press corp.

Aerospace

January 7, 1971

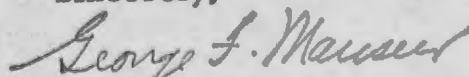
Mr. Nicholas Zapple
Counsel
Senate Commerce Committee
United States Senate
Washington, D. C. 20510

Dear Nick:

Use of satellites for air traffic control communications in the oceanic basins to replace existing marginal communications has been considered for many years. Several competing programs have been advanced by NASA, FAA, COMSAT, and private industry. The Office of Telecommunications Policy initiated an Executive Office study approximately three months ago to resolve the technical issues and institutional arrangements which have delayed program development.

The Executive Office Working Group has completed its activities and based on their findings the Office of Telecommunications Policy has prepared the attached Statement of Government Policy on Satellite Telecommunications for International Civil Aviation Operations. The Policy Statement will be made public at 2:00 PM, January 7, and we would like to make available to you this advance copy of the Policy Statement and related press release.

Sincerely,


George F. Mansur

Encls

Identical letters forwarded to:

Nick Zapple, Senate Commerce Committee
James J. Gehrig, Senate Space Committee
Frank Hammill, House Space Committee
Art Pankopf, Senate Commerce Committee
Bob Guthrie, House Commerce Committee

Rewritten: CTWhitehead/tw
Mr. Whitehead
Dr. Mansur/Olsson/Subj File/RF

*Amended
Subtitle*

January 8, 1971

Honorable William P. Rogers
Secretary of State
Washington, D. C. 20520

Dear Mr. Secretary:

The Administration has completed a policy review on aeronautical telecommunications via satellites for international civil aviation. The Administration's position in this matter is contained in the attachment, "Statement of Government Policy on Satellite Telecommunications for International Civil Aviation Operations."

The Government policy provides a broad framework of objectives, technical and operational arrangements, management arrangements and economic arrangements to guide the Executive Branch agencies during the year ahead. Among other things, the policy affirms the lead management agency role of the Department of Transportation and the supporting role of the Department of State.

We believe the Government policy represents an effective approach to achieving the communications necessary for continued safety and improved efficiency of international air travel. We also believe that the United States has the opportunity to continue its leadership role in civil aviation by aggressive implementation of the enunciated policy. The Department of State has an important role in achieving a successful program.

We plan to supplement the policy statement in the near future with more specific program guidelines. Meanwhile, the attached policy statement will be used by the Executive Branch in reorienting its efforts in this field, including subsequent United States participation in international meetings.

I would like to express our appreciation for your Department's contributions to the policy review and specifically acknowledge the valuable efforts of Messrs. Bert Rein, Robert Packard, Thomas Nelson and Colonel Richard Campbell.

Sincerely,


Clay T. Whitehead

Encl.

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF TELECOMMUNICATIONS POLICY
WASHINGTON, D.C. 20504

Amos
DIRECTOR

January 7, 1971

Honorable John A. Volpe
Secretary of Transportation
Washington, D. C. 20590

Dear Mr. Secretary:

The Administration has completed a policy review on aeronautical telecommunications via satellites for international civil aviation. The Administration's position in this matter is contained in the attachment, "Statement of Government Policy on Satellite Telecommunications for International Civil Aviation Operations."

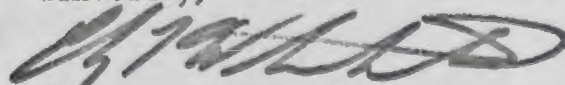
The Government policy provides a broad framework of objectives, technical and operational arrangements, management arrangements and economic arrangements to guide the Executive Branch agencies during the year ahead. Among other things, the policy affirms the lead management agency role of the Department of Transportation.

We believe the Government policy represents an effective approach to achieving the communications necessary for continued safety and improved efficiency of international air travel. We also believe that the United States has the opportunity to continue its leadership role in civil aviation by aggressive implementation of the enunciated policy. The Department of Transportation has the key role in achieving a successful program.

We plan to supplement the policy statement in the near future with more specific program guidelines. In this, we will work closely with the Department of Transportation. Meanwhile, the attached policy statement will be used by the Executive Branch in reorienting its efforts in this field, including subsequent United States participation in international meetings.

I would like to express our appreciation for your Department's contributions to the policy review and to assure you of my continuing interest and support.

Sincerely,



Clay T. Whitehead

Encl.

Thursday 1/7/71

*Atmospheric
satellite*
MEETING
1/8/71
2:30

6:00

At 2:30, January 8, Tom Nelson is coming over to talk to Dr. Mansur and Charlie Joyce on "satellites and cables. "
Dr. Mansur thought you might like to poke your head in.

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF TELECOMMUNICATIONS POLICY
WASHINGTON, D.C. 20504

Erlichman
Flanigan
Kissinger

January 7, 1971

PRESS RELEASE

NIXON ADMINISTRATION ANNOUNCES POLICY
ON AERONAUTICAL SATELLITE COMMUNICATIONS

Clay T. Whitehead, Director of Telecommunications Policy, announced today the release of a "Statement of Government Policy on Satellite Telecommunications for International Civil Aviation Operations." The policy provides the framework for the development of aeronautical satellite programs during the 1970's.

This policy was established by the Director after a study conducted within the Executive Office of the President with participation by interested agencies in the Executive Branch. The Deputy Director, OTP, George F. Mansur, chaired the study group and coordinated the OTP policy formulation.

The highlights of the policy statement are:

- Due to the limitations of existing communications and the projected increase in air traffic in the oceanic areas, the United States promotes pre-operational deployment of satellite communications in the Pacific in 1973 and Atlantic in 1975.
- The Department of Transportation/Federal Aviation Administration, which has the statutory responsibility for air traffic control, assumes program management responsibility within the government for pre-operational and operational systems and services.

- The Department of State, in conjunction with the Department of Transportation, will seek international utilization of the pre-operational system and initiate cooperative efforts with other nations to establish an operational system by 1980.
- The Government will utilize commercial communications facilities and services to the maximum extent feasible.
- The Government will utilize the UHF frequency band near 1600 MHz in both pre-operational and operational satellite air traffic control communications.
- Experimental evaluation of independent surveillance by satellite should begin with initial system deployment in the Pacific and should be followed by pre-operational evaluation in an air traffic control environment sometime after 1975.
- A unified program to satisfy both Government and airline requirements in the Pacific and Atlantic Ocean areas should be adopted to provide the economic benefits of a single program.

The United States has primary responsibility for air traffic control in the Pacific basin and other oceanic routes through agreements with the International Civil Aviation Organization. Because of the rapid increase in aircraft density on international routes and the limitations of existing communications systems, improved communications services must be employed to assure aircraft safety and to efficiently control air traffic.

Although satellite systems offer the most promising method to meet these communications requirements, there have been extended delays in reaching the decisions necessary to initiate an appropriate program. The policy statement resolves the major issues that have been responsible for the delays and establishes guidelines that will ensure orderly progress of a national program. Periodic program reviews will be established to evaluate the progress being made to meet the objectives of the policy statement.

Government use of commercial communication facilities and services helps to lower costs and agrees with the Administration's policy of encouraging the vitality of the private sector in developing and providing communication services. This policy envisages that the FAA will contract for services on a lease basis in contrast to government procurement and ownership of systems.

The President, in his statement on space of March 7, 1970 stated:

- "We should hasten and expand the practical applications of space technology...."
- "We should encourage greater international cooperation in space...."

This policy furthers those objectives by bringing about the timely and useful applications of American space technology for an important purpose in a way that will benefit all nations.

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EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF TELECOMMUNICATIONS POLICY
WASHINGTON, D.C. 20504

STATEMENT OF GOVERNMENT POLICY
ON
SATELLITE TELECOMMUNICATIONS
FOR
INTERNATIONAL CIVIL AVIATION OPERATIONS

January 7, 1971

The rapid increase in aircraft traffic densities, the introduction of larger passenger aircraft on international overseas routes, and the limitations of existing communications channels make it increasingly clear that improved telecommunications will be required for air traffic control to speed the flow of traffic and to assure aircraft safety.

The Federal Aviation Administration (FAA) has defined and stated the general quantity and quality of the telecommunication services that will be needed to support expected future air traffic control operations. Specific requirements have been established for voice and data communications and for automatic reporting of aircraft position information over both the Atlantic and Pacific Oceans in the early 1970's. The FAA also anticipates an operational requirement for independent surveillance in the late 1970's or early 1980's.

It is clear that the provision of these services is in the public and national interest. There is broad consensus in both government and the private sector that satellites offer technically and economically the most practicable method to meet the requirements in a reliable way. This policy statement is provided to establish guidelines that will permit the effective, efficient, and orderly progress of a national program to provide the needed services.

OBJECTIVES

The objectives of this policy are to:

1. Assure the safety, efficiency, and economic viability of international civil aviation.
2. Promote the timely and useful application of technological advances to assure adequate, reliable, and economic telecommunications for air traffic control, operational control, and search and rescue.
3. Assure that program institutional arrangements are responsive to the requirements of the users, compatible with the evolving National Aviation System, and consistent with the foreign policy objectives and commitments of the United States.
4. Encourage international cooperation in research, development, and applications programs within an institutional framework which assures effective utilization of resources.

5. Facilitate early deployment of advanced applications such as independent surveillance and navigation.
6. Minimize duplication of Federal facilities and programs and encourage the use of facilities available from the private sector.

TECHNICAL AND OPERATIONAL ARRANGEMENTS

Pre-operational use and evaluation of voice communications should be implemented in the Pacific in 1973 and Atlantic in 1975. Pre-operational deployment of data link communications and automatic reporting of aircraft position will be promoted in the Atlantic and Pacific in 1975. Feasibility demonstration of independent surveillance in an Air Traffic Control environment will be promoted in the Pacific in 1973, with subsequent transition to a pre-operational evaluation in the Pacific and Atlantic in the post-1975 time period.

It is the Government's policy to promote use of the UHF frequency band near 1600 MHz in the operational system. This will alleviate serious spectrum congestion at VHF frequencies, permit early achievement of the benefits of independent surveillance, and accords with foreign Administration preferences. Use of UHF rather than VHF in the pre-operational system will avoid economic, technical, and operational difficulties -- both domestic and international -- which would result from a later transition from a VHF system to the UHF band. In support of this objective, the Government will utilize UHF for air traffic control purposes in the pre-operational system.

To assure orderly growth and efficient deployment of aeronautical satellite systems, implementation of initial systems should be compatible with long-term objectives. Communications in the wide sense and reliable knowledge of aircraft position will continue to be essential parameters in the air traffic control system. The Federal Aviation Administration's National Aviation System Ten-Year Plan (1971-1980) and studies recently completed by the President's Science Advisory Committee suggest that the long-term role of communications in air traffic control will involve automatic data collection, data processing, control, and display utilizing digital data links and digital processing techniques. Pre-operational satellite communication and surveillance systems in the Pacific and Atlantic oceanic areas should be

designed and phased in coordination with the domestic plan to assure interoperability between the international and domestic systems with the consequent economies and operational advantages.

MANAGEMENT ARRANGEMENTS

Development of an effective national program requires unambiguous leadership. Accordingly, the Department of Transportation (DOT), as the Federal agency with statutory operational obligations, is to be the lead management agency and to assume responsibility for defining requirements, program budgeting, and management of pre-operational and operational systems activity.

In order to assure that the broad spectrum of space activities supported by the Government is effectively utilized and not duplicated, the National Aeronautics and Space Administration (NASA) is expected to conduct independent research and development on technologies which have broad application and, under the management and budget of the Department of Transportation, to provide other technical support unique to transportation applications. Both the DOT and NASA should give consideration to the desirability of conducting fundamental research on competing technologies in order to assure that continuing system development is making full and economic utilization of technological possibilities.

Because the program heavily involves the international community and must be conducted in accord with treaty obligations and other pertinent inter-governmental agreements, the Department of State will exercise its responsibility to assure effective and timely coordination with foreign Administrations and international organizations. Through the Department of State, the Department of Transportation as the management agency should seek international utilization of the pre-operational system and should initiate cooperative activity with other nations to establish an operational system in the Atlantic and Pacific oceanic areas by 1980.

It is possible that a single system combining the functions of communications and position fixing to support both maritime and aviation services would permit economic benefits in a worldwide operational system. The DOT should work with appropriate government agencies to explore the feasibility and desirability of such an approach.

ECONOMIC ARRANGEMENTS

The two broad classes of potential users of an aeronautical satellite system are the aviation administrations responsible for air traffic control in the various International Civil Aviation Organization world regions and the airlines flying international oceanic air routes. Substantial economic resources are required to develop and deploy an aeronautical satellite system, and there are economic benefits to be derived from combining government and airline requirements in both the Atlantic and Pacific ocean areas into a single program. The DOT should actively encourage arrangements for use of a common system by all segments of the aviation community which distributes financial responsibilities equitably among users.

The Government shall utilize commercial telecommunications facilities and services to the maximum extent feasible in both pre-operational and operational systems.

Aeronautical
satellite

Eva -

If any public announcement or policy statement regarding aeronautical satellites is released this week - please see to it that the following two people are notified and provided with any documents released ..

Mr. David Brown - Editor, Aviation Week.

Office Phone - 737 - 6630

Night Line - NA8 - 3413

Immediately mail any documents available to

AIRMAIL
SPEC. DEL

Phil Klass
Kian dra Lodge
Vail, Colorado

Steve.

January 6, 1971

File - Aeronauts SED

ACTION LIST
STATEMENT OF GOVERNMENT POLICY
ON
AERONAUTICAL SATELLITES

- o Inform Peter Flanigan and John Ehrlichman's secretaries - Timmie/Mansur
- o Inform Secor Browne, CAB
Send Advanced Copy Mansur
- o Call and send Advanced Copy to FCC - Strassburg Mansur
- o Inform W/H Press Office Told John Andrews - sent copy 1/6 - 4:30 Doyle
Inform Herb Kline - Rob Odle - has copy will do. 1/6 - 4:30
- o Call Congress - Senate Commerce (Zapple) (Pankopf)
Send Advanced Copies - Space (Gehrig) } Mansur
House Commerce (Berry) (Guthrie)
Space (Hammill)
- o Brief U.S. Delegation to ASTRA IV - 9:30, Fri., 8 Jan. Olsson
- o Meet with DoT/FAA) 1000 Wed. 6 Jan Mansur/Olsson
NASA)
- o Meet with ATA & ARINC -- 1100 Wed. 6 Jan Mansur/Olsson
- o Working Group Meeting -- 3:30 Wed. 6 Jan Olsson
- o Talk with Phil Klass -- 5:00, Wed. 6 Jan Mansur/Doyle
- o Mansur talk to Dave Solomon - Mansur
- o DoS Dispatch to POSTS -- 6 Jan Nelson (DoS)
Administrations and ICAO
- o Press Release -- AM 7 Jan { Doyle
(Embargo until 2 PM 7 Jan)
- o Press Conference -- 2:00 7 Jan Mansur/Whitehead
- o Send Letters to Companies Mansur/Olsson
- o Letters to NASA and DoT with Policy Mansur/Whitehead



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546

*Aeronautical
satellite*

OFFICE OF THE ADMINISTRATOR

December 31, 1970

Dr. Clay T. Whitehead
Director
Office of Telecommunications Policy
Washington, D.C. 20504

Dear Dr. Whitehead:

This is in reply to your request for comments on the draft policy statement on satellite communications for overseas aeronautical operations sent to us with your letter of December 23, 1970.

In addition to recommendations on the draft policy statement itself (greater recognition of international aspects, clarification on NASA's role in its areas of competence and responsibility, and a few minor and editorial changes), I have outlined briefly below the course of action that I believe NASA, in concert with the Department of Transportation, should now follow in implementation of the policy statement. I am not recommending that these more specific matters be included in the policy statement; on the contrary, it is essential that the detailed implementation of the policy be left, with an adequate degree of flexibility, to the responsible action agencies. However, we want to be sure that the actions proposed to be taken under the policy statement are clearly understood by all concerned.

Our comments and views have been coordinated with and have the concurrence of the Department of Transportation and are generally consistent with the DOT-NASA Memorandum of Understanding of October 23, 1970, which has previously been made available to you. We believe that this Memorandum of Understanding represents a sound approach to the problem and that it is generally consistent with your draft policy statement, with the few exceptions discussed in the NASA and DOT letters commenting on it. Since

it appears that your group may have received inputs from industry and elsewhere not available to DOT and NASA at the time the details of the DOT-NASA Memorandum of Understanding were developed, we agree with DOT that it would be desirable to have a full exchange of information and further technical and economic discussions with your office prior to policy or budgetary decisions which might close the door on courses of action, including those proposed in the Memorandum of Understanding, which may prove after further consideration to be in the best interest of the United States.

International Aspects

As now drafted the policy statement can be read as implying that the U.S. will proceed unilaterally to develop and deploy preoperational systems which we would urge other nations to utilize. We believe that U.S. policy should clearly recognize the desires of the Europeans to participate in the development as well as the utilization of a preoperational system in the Atlantic and the desirability to the U.S., from cost-sharing and other standpoints, of having them do so. The European interest in this regard has been reaffirmed as recently as December 22, 1970, when specific approval was given to a \$5 million budget allocation to ESRO for Phase B studies of the technical parameters and design of an air traffic control satellite system for the North Atlantic consistent with the program defined in the DOT-NASA Memorandum of Understanding.

We assume that the statement on pages 5 and 6 regarding the need for international coordination and possible international utilization of aeronautical satellite systems and services was not meant to exclude international participation in the development of such systems or in experimental activity which may be required. Thus, under the proposed policy, NASA would expect to continue, in concert with DOT and the Department of State, to work cooperatively with the European Space Research Organization in further studies of systems to meet the requirements as stated by DOT and agreed to by the Europeans.

Accordingly, I believe that the policy statement, especially since it will become a public document, should recognize more explicitly Europe's priority commitment to an aeronautical

satellite technology development program and the President's desire for international participation and cost-sharing in space applications. One specific change would be to insert the words: "participation in the development and" between the words "international" and "utilization" in line 4 on page 6.

Management Arrangements - NASA's Role

The delineation of management arrangements and the roles of DOT and NASA with respect to aeronautical satellites requires refinement in two respects. Both points made below are based on the underlying rationale that the Government should take full advantage of and avoid duplication of NASA's capabilities in space technology in accordance with the opening sentence of the second paragraph on page 5 of the draft policy statement. Also, on both points, the role indicated for NASA corresponds exactly to the role NASA has historically had in the analogous situation with the Department of Commerce on meteorological satellite systems.

1. It should be made clear that the development by the Government of experimental satellites for aeronautical operations (as for other civil purposes) is a responsibility of NASA under the National Aeronautics and Space Act of 1958, and that NASA should have budgetary and management responsibility for such satellites, even when (as has been the case with experimental communications and meteorological satellites) the experimental satellites, if successful, are also to be used in a preoperational system. Thus, in cases where the proof of concept of a preoperational system involves experimentation with new types of spacecraft technology or equipment, NASA should be responsible for the actual development, working against requirements specified by the responsible operating agency and turning the satellites over to the operating agency, at the appropriate time, for use in preoperational or operational systems. The validity and value of this procedure in the effective development of space applications capabilities has been repeatedly demonstrated over the past ten years in the communications and meteorological fields.

The Department of Transportation agrees that this approach should also be followed with respect to aeronautical satellites. Specifically, this means that if the Phase B studies of the so-called NASA-ESRO satellite, and related studies by DOT and others, lead to a decision by DOT as the responsible U.S. lead agency (with

proper international participation) to proceed with an experimental satellite which could be used in a preoperational system, NASA would be responsible for budgeting and managing the development of the experimental satellite for the U.S. under whatever U.S. - ESRO working arrangements are established. NASA fully agrees that DOT should be the lead agency, should specify the requirements to be met, and should manage preoperational and operational activities.

2. It should be made clear that when the exercise of its responsibilities requires DOT to undertake the procurement of satellite systems or other activities requiring on the part of the Government extensive technical and management competence in satellite design, procurement, test, checkout, and launch, DOT will utilize NASA's competence and facilities in these areas on a reimbursable basis rather than establish separate additional capabilities within the Government for this purpose. This policy is analogous to the well-established and successful working arrangement between the Department of Commerce and NASA with respect to operational meteorological satellites. It should be noted that the planned working arrangement does not contemplate that DOT would work through NASA in the direct procurement of services which may be provided by communications or other satellite systems under arrangements where there is no need for in-depth technical monitoring or support by the Government of the contractor's activities.

Proposed specific modifications to the language on page 5 to reflect the two points made above are attached for your consideration.

Minor and Editorial

1. Title and Opening Paragraph - Since the systems and services to which the policy is addressed involve both communications and surveillance, we suggest that the title of the policy paper and the opening paragraph, now limited to communications, should be broadened. A more descriptive title might be: "Statement of Government Policy on Civil Aeronautical Satellite Systems and Services for International Air Traffic." In the opening paragraph, on line 7, the phrase "and independent surveillance"

should be inserted between "better communications" and "for air traffic."

2. Reference to Requirements - In the second paragraph on page 1 there should be a citation identifying the FAA requirements referred to. We assume that the requirements referred to are the same as those contained in the Memorandum of Understanding signed by the Department of Transportation, Federal Aviation Administration, and National Aeronautics and Space Administration which has been forwarded to you by the agencies concerned.

3. Reference to Delays - We wonder if any useful purpose is served by the inclusion in a policy statement of the comments on "extended delays" at the bottom of page 1 and the top of page 2.

4. Statement of Objectives - We suggest insertion of the phrase "and independent surveillance" after the word "communications" in line 3 of item 5 on page 3, for the reasons given in item 1 above.

NASA Planned Actions

As indicated above, NASA and DOT believe that the integrated program embodied in the DOT-NASA Memorandum of Understanding is generally consistent with the draft policy statement and that it represents the most cost-effective approach for meeting the operational requirements of the several users and for developing the technology which will be required for air traffic control.

Accordingly, we propose to take the steps necessary, within funds available to NASA in FY 1971 and 1972, to meet U.S. responsibilities for continuing studies and preparatory work with the Europeans so that proper joint decisions can be made at the appropriate time on the satellite systems to be employed to meet the needs for aeronautical satellites in the Atlantic area in 1975. DOT agrees that we should do this. We understand that DOT plans to proceed to procure aeronautical satellite services in the Pacific area; we support their plans.

The basic reasons why NASA should proceed with studies and preparatory work in concert with ESRO is to preserve the possibility of a joint and cost-shared program with the Europeans. NASA and ESRO studies and preparatory development work are required to

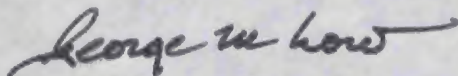
determine whether, as DOT and NASA now believe, the experimental satellite system contemplated in the DOT-NASA Memorandum of Understanding for preoperational use in the Atlantic area in 1975 is the most cost-effective approach to meeting the operational requirements for air traffic control in the late 1970's and early 1980's. NASA's agreement with ESRO for studies and preparatory work need not imply a commitment at this time to this system for preoperational or operational use. Rather, it would provide a basis for subsequent decisions, together with corresponding studies by DOT (with NASA assistance as appropriate) of other approaches and proposals. We believe it is also important that prior to acceptance or reliance upon one or another of the proposals now being put forward by prospective contractors, a qualified Government team should make critical evaluations in depth of both technical and cost aspects of these proposals.

As has been presented to your staff, the key potential advantages of the so-called NASA-ESRO satellite system envisaged in the DOT-NASA Memorandum of Understanding are (1) the possibility, if the experimental satellite is successful, of meeting preoperational and future operational requirements with fewer satellites--still requiring only a Thor-Delta class launch vehicle--than the equivalent alternatives now under discussion, and (2) the expressed interest of the Europeans in cost-sharing in both the development and subsequent phases. The cost of the space segment of the prospective experimental-preoperational system for the Atlantic area, including launch vehicles, is estimated at about \$94 million. ESRO is prepared at this time to carry half of this cost, which would reduce the required U.S. outlay by about \$47 million. While further consideration might show that this approach, or one similar to it, is not the optimum course to follow, DOT and NASA feel strongly that the case is clearly good enough at this time to warrant its continued serious consideration by DOT and NASA and by the U.S. and ESRO, and to justify proceeding with the NASA-ESRO studies as outlined above.

We will be glad to discuss any of the points in this letter further with you, and would want to do so prior to final

decisions if you find yourself in substantial disagreement with our views and recommendations.

Sincerely yours,

A handwritten signature in cursive script that reads "George M. Low".

George M. Low
Acting Administrator

Enclosure

cc: Mr. James M. Beggs
Mr. William A. Anders
Mr. Donald B. Rice
Dr. George F. Mansur



Recommended Restatement of Second Paragraph on Page 5 Under
"Management Arrangements" (Language to be inserted underlined;
language to be omitted bracketed)

In order to assure that the broad spectrum of space activities supported by the Government is effectively utilized and not duplicated, the National Aeronautics and Space Administration is expected to (1) will conduct independent research and development, including experimentation in space, on technologies which have broad application and will be responsible for the budgeting and management of experimental aeronautical satellites for proof of concept which NASA and DOT jointly deem to be desirable in the evolution of an operational satellite system for air traffic control, and (2) will, under the management and budget of the Department of Transportation, to (a) provide other technical support unique to transportation applications and (b) serve as DOT's agent in the design, procurement, test, checkout, or launch of the space segments of the ATC system when such activities would require duplication of staff and facilities which exist at NASA. Both the DOT and NASA should give consideration to the desirability of conducting fundamental research on competing technologies in order to assure that continuing system development is making full and economic utilization of technological possibilities.



Office of Telecommunications Policy
Route Slip

31 DEC 1970

To

Clay T. Whitehead

~~George F. Mansur~~

William Plummer

Wilfrid Dean

~~Steve Doyle~~

Walt Hinchman

Charles Joyce

William Lyons

Eva Daughtrey

Timmie White

Judy Morton

REMARKS

Col. Olson has a copy
Tom W - as noted in the
letter, we have the specific
changes which Rich Stair
recommends. They are
relatively minor and
we will incorporate them
into the draft.
LMM.

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

*Aeronautical
Satellite*

DEC 29 1970

The Honorable Clay T. Whitehead
Director, Office of Telecommunications Policy
Executive Office of the President
Washington, D.C. 20504

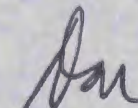
Dear Tom:

As requested by Dr. Mansur, we have reviewed the draft policy paper, find it in accord with the sense of the Working Group, and have no objection to release of the substantive findings contained in the policy document.

We would, however, stress two points concerning presentation to the agencies and to the public. The proposed summary should be revised to reflect these points. To avoid speculation that the policy encourages duplicative Federal facilities or responsibilities, or that NASA's statutory R&D and consultative role is being deemphasized, the summary should recognize NASA's primary role in satellite technology. Similarly, since the policy substantially changes the two system approach proposed by NASA and FAA, the summary should state that the economic viability of an aerosat system is dependent upon combining requirements into a single program which equitably distributes financial responsibility among all users. Editorial comments have been provided to your staff.

The Executive Office Working Group on Aeronautical Satellite Systems contributed directly to the budget process. This evolving policy position should provide Federal agencies and industry with a focal point for more balanced program planning. Your efforts in convening this worthwhile undertaking have been most helpful.

Sincerely,



Donald B. Rice
Assistant Director



*International
Communications*

December 24, 1970

MEMORANDUM FOR

Secretary of State
Secretary of Defense
Director of Central Intelligence Agency

Reference is made to your departmental positions regarding the licensing of facilities for international communications (FCC Docket 18875).

The Department of State indicated the mix of facilities over the high-density routes is adequate for the foreseeable future. The CIA encouraged a mix of facilities sufficient to enable alternate routings for circuits furnished by commercial carriers without commenting on the present or projected adequacy of existing facilities. The Department of Defense encouraged actions to stimulate the growth and expansion of overseas facilities without regard to their present or future adequacy in meeting national defense needs. It is not clear that any single, coordinated position, agreed to by all executive departments and agencies, is emerging on this issue.

We are developing the position of this Administration on the policy issues involved in the authorization of facilities for international telecommunications. Discussions will soon begin between representatives of the U. S. Government and European telecommunications entities, giving some urgency to the development of a coordinated Government position on this matter.

A particularly important aspect of this subject is the requirement of the U. S. national security community for assured telecommunications service in support of critical functions. Any reasonable position on this matter must be based on an understanding of the quantitative and qualitative aspects of important telecommunications requirements. Accordingly, would you please provide me with information concerning your expected trans-Atlantic telecommunications requirements sufficient to assess the adequacy of existing and projected common carrier facilities. This might be done most expeditiously by designating a representative to work with my staff to collect and organize the information at an appropriate level of detail.

- 2 -

We will, of course, consult with you in the development of an Executive Branch position on this matter.

15/
Clay T. Whitehead

CCJoyce:hmy

12-24-70

cc: DTP - 2 ✓

Chron File

Subj. File

December 23, 1970

MEMORANDUM FOR

Mr. Bertram Rein
Deputy Assistant Secretary for
Transportation and Telecommunications
Department of State

Since we last discussed the aeronautical satellite question, we have redone the draft policy statement. I have sent copies of this to Transportation, FAA, and NASA for their comments.

I would appreciate any informal comments you might have, either on the paper itself or on an appropriate schedule for briefing international organizations and airlines.

Clay T. Whitehead

Attachment

cc: Dr. George Mansur
Col. Olsson
Steve Doyle

CTWhitehead:ed

As per attached
File

December 23, 1970

Honorable James M. Beggs
Under Secretary of Transportation
Room 10200
400 - 7th Street, S. W.
Washington, D. C. 20590

Dear Mr. Beggs:

As discussed with George Mansur last week, I am forwarding for your comment the draft policy statement on satellite communications for overseas civil aeronautical operations.

We would appreciate receiving your comments by December 31st.

Sincerely,

Clay T. Whitehead

Enclosure

cc: Mr. John H. Shaffer
Dr. George Mansur
Col Olsson
Steve Doyle

CTWhitehead:ed

*Aeronautical
Satellite*

December 23, 1970

Honorable George M. Low
Administrator
National Aeronautics and
Space Administration
Room 7137
400 Maryland Avenue, S. W.
Washington, D. C. 20546

Dear Mr. Low:

As discussed with George Mansur last week, I am forwarding for your comment the draft policy statement on satellite communications for overseas civil aeronautical operations.

We would appreciate receiving your comments by December 31st.

Sincerely,

Clay T. Whitehead

Enclosure

cc: Dr. George Mansur
Col. Olsson
Steve Doyle

ctwhitehead:ed

(FOR OFFICIAL USE ONLY)

STATEMENT OF GOVERNMENT POLICY
ON
SATELLITE COMMUNICATIONS
FOR
OVERSEAS CIVIL AERONAUTICAL OPERATIONS

(FOR OFFICIAL USE ONLY)

December 1970

As a result of the rapid increase in aircraft traffic densities on international overseas routes and because of the marginal performance of existing communications channels, it has become increasingly clear that improved communications will be required

to assure aircraft safety and speed the flow of traffic.

With the advent of larger passenger aircraft and increases in traffic volume in oceanic areas, better communications for air traffic control, operational control, and search and rescue have become more critical.

The Federal Aviation Administration has defined and stated the general quantity and quality of the telecommunication services that will be needed to support expected future air traffic control operations. Specific requirements have been established for voice and data communications and for automatic reporting of aircraft position information over both the Atlantic and Pacific Oceans in the early 1970's. The Federal Aviation Administration also anticipates and operational requirement for independent surveillance in the late 1970's or early 1980's.

It is clear that the provision of these services is in the public and national interest. There is broad consensus in both government and the private sector that satellites offer technically and economically the most practicable method to meet the requirements in a reliable way. However, there have been extended delays in

reaching the decisions necessary to begin the development and deployment of the appropriate systems. This policy statement is provided to resolve the major issues that have been responsible for the delay and to establish guidelines that will permit the effective, efficient, and orderly progress of a national program to provide the needed services.

OBJECTIVES

The objectives of this policy are to:

1. Assure the safety, efficiency, and economic viability of international civil aviation.
2. Assure that program institutional arrangements are responsive to the requirements of the users, compatible with the evolving National Aviation System, and consistent with the foreign policy objectives and commitments of the United States.
3. Facilitate early deployment of advanced applications such as independent surveillance and navigation.
4. Encourage international cooperation in research, development, and applications programs within an institutional framework which assures effective utilization of resources.

5. Promote the timely useful application of technological advances to assure adequate, reliable, and economic communications for air traffic control, operational control, and search and rescue.
6. Minimize duplication of Federal facilities and program and encourage the use of facilities available from the private sector.

TECHNICAL AND OPERATIONAL ARRANGEMENTS

Pre-operational use and evaluation of voice communications should be implemented in the Pacific in 1973 and Atlantic in 1975. Pre-operational deployment of data link communications and automatic reporting of aircraft position will be promoted in the Atlantic and Pacific in 1975. Feasibility demonstration of independent surveillance in an Air Traffic Control environment will be promoted in the Pacific in 1973, with subsequent transition to a pre-operational evaluation in the Pacific and Atlantic in the post-1975 time period.

It is the Government's policy to promote use of the UHF frequency band near 1600 MHz in the operational system. This will alleviate serious spectrum congestion at VHF frequencies, permit early achievement of the benefits of independent surveillance, and accords

with foreign Administration preferences. Use of UHF rather than VHF in the pre-operational system will avoid international economic, technical, and operational difficulties which would result from a later transition from a VHF system to the UHF band. In support of this objective the Government will utilize UHF for air traffic control purposes in the pre-operational system.

To assure orderly growth and efficient deployment of aeronautical satellite systems, implementation of initial systems should be compatible with long term objectives. Communications in the wide sense and reliable knowledge of aircraft position will continue to be essential parameters in the air traffic control system. The Federal Aviation Administration's National Aviation System Ten-Year Plan (1971-1980) and studies recently completed by the President's Science Advisory Committee suggest that the long-term role of communications in air traffic control will involve automatic data collection, data processing, control, and display utilizing digital data links and digital processing techniques. Pre-operational satellite communication and surveillance systems in the Pacific and Atlantic oceanic areas should be designed phased in coordination with the domestic plan to assure inter-operability between the international and domestic systems with the consequent economies and operational advantages.

MANAGEMENT ARRANGEMENTS

Development of an effective national program requires unambiguous leadership. Accordingly, the Department of Transportation, as the Federal agency with statutory operational obligations, is to be the lead management agency and to assume responsibility for defining requirements, program budgeting, and management of pre-operational and operational activities.

that

In order to assure the broad spectrum of space activities supported by the Government is effectively utilized and not duplicated, the National Aeronautics and Space Administration is expected to conduct independent research and development on technologies which have broad application and, under the management and budget of the Department of Transportation, to provide other technical support unique to transportation applications. Both the DoT and NASA should give consideration to the desirability of conducting fundamental research on competing technologies in order to assure that continuing system development is making full and economic utilization of technological possibilities.

Because the program heavily involves the international community and must be conducted in accord with treaty obligations and other pertinent inter-governmental agreements, the Department of State

will exercise its responsibility to assure effective and timely coordination with foreign Administrations and international organizations. Through the Department of State, the Department of Transportation as the management agency should seek international utilization of the pre-operational system and initiate activity to establish an operational system in the Atlantic and Pacific oceanic areas by 1980.

It is possible that a single system combining the functions of communications and position fixing to support both maritime and aviation services would permit economic benefits in a worldwide operational system. The DoT should work with appropriate government agencies to explore the feasibility and desirability of such an approach.

ECONOMIC ARRANGEMENTS

The two broad classes of potential users of an aeronautical satellite system are the aviation administrations responsible for air traffic control in the various ICAO world regions and the airlines flying international oceanic air routes. Substantial economic resources are required to develop and deploy an aeronautical satellite system, and there are economic benefits to be derived from combining government and airline requirements into a single program. The DoT should actively encourage arrangements for use of a common system

by all segments of the aviation community.

Planning for the program should utilize commercial sources to the maximum extent feasible in both pre-operational and operational systems.

*Aeronautical
satellite*

OFFICE OF TELECOMMUNICATIONS POLICY
WASHINGTON

December 15, 1970

Tom-

Assuming your discussions with Flanigan, et al are affirmative we plan the following:

1. Draft has been sent to OMB, OST, State, NSC, NASC with request for concurrence on substantive issues. This was done today.
2. Have draft memo to dispatch courtesy info copy to FCC on Thursday. Had meeting with them last week to bring them up-to-date.
3. Have draft memo to attach to policy to hand to DoT, NASA in brief meeting on Wednesday, asking if they take issue with substantive positions and asking for 24-hour response.
4. Have draft memo to ARINC, ATA, to dispatch courtesy copies Friday noon.
5. State is preparing information dispatch for all American Embassies for Thursday.
6. Justice is reviewing draft.
7. Have draft letter for Rogers, Volpe, Laird, Shultz, Low to dispatch final document at 12:00 noon Friday.
8. Press release and kit being prepared for 4 PM Friday release (after IWG adjourns).

George

*also noted
S. L. H. H.*

Monday 12/7/70

MEETING
12/8/70
12noon

(Pronounced Norich)

3:20 Mr. Knoerich (Scientific Attache at the Germany Embassy) called to ask for an appointment with Mr. Whitehead to discuss the memorandum of the German government concerning planned American and air traffic controls. 331-3330

Steve suggested he talk with Dr. Mansur, who is most vitally concerned with this.

Mr. Knoerich will come in to see Dr. Mansur at noon on Tuesday (12/8).

Aerosat

Comsat

Monday 12/7/70

MEETING

12/7/70

12:30 p. m.

11:25 Steve advises that the luncheon with Dr. Charyk and Dave Acheson concerns a discussion of the Pausch letter and Comsat's interests in that letter -- European views on satellites and cables.

FCC

Monday 12/7/70

MEETING

12/7/70

12:30 p. m.

9:50 This is the subject of the meeting with Dr. Charyk and
Dave Acheson at luncheon today at 12:30 at the Met Club.

STATE - A.I.D. - USIA ROUTING SLIP					DATE 11/25/70	
TO:	Name or Title	Orgn. Symbol	Room No.	Bldg.	Initials	Date
1.	Mr. Whitehead	OTP				
2.						
3.						
4.						
5.						

<input type="checkbox"/> Approval	<input checked="" type="checkbox"/> For Your Information	<input type="checkbox"/> Note and Return
<input type="checkbox"/> As Requested	<input type="checkbox"/> Initial for Clearance	<input type="checkbox"/> Per Conversation
<input type="checkbox"/> Comment	<input type="checkbox"/> Investigate	<input type="checkbox"/> Prepare Reply
<input type="checkbox"/> File	<input type="checkbox"/> Justify	<input type="checkbox"/> See Me
<input type="checkbox"/> For Correction	<input type="checkbox"/> Necessary Action	<input type="checkbox"/> Signature

REMARKS OR ADDITIONAL ROUTING

FROM: (Name and Org. Symbol)	ROOM NO. & BLDG.	PHONE NO.
E/TD: Thomas E. Nelson		

DER BUNDESMINISTER FÜR DAS POST- UND FERNMELDEWESEN

Der Bundesminister für das Post- und Fernmeldewesen • 53 Bonn 1 • Postfach 2001

Mr. Nelson,
Acting Director Officer of
Telecommunications,
Department of State

Washington, D.C. 20520
USA

Ihr Zeichen
Votre référence
Your reference

Ihre Nachricht vom
Votre lettre du
Your letter of

Meine Nachricht vom
Ma lettre du
My letter of

Mein Zeichen
Ma référence
My reference

Bonn

II Ka 4214-0/20 November 17, 1970

Betreff/Objet/Subject

Dear Mr. Nelson,

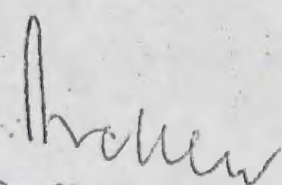
Permit me to send you for your information a copy of a letter which I addressed to Federal Communications Commission on behalf of European administrations and operating agencies as the result of a meeting which was held in Munich on November 2 and 3, 1970. May I assume that you are also of the opinion that the questions which have been dealt with in that letter should be discussed in detail during a joint meeting and that a solution should be found to them.

Enclosures:

Copy of the letter addressed
to FCC with Annex

Sincerely,

By direction of the Minister


Preßler

Der Bundesminister für das Post- und Fernmeldewesen - 53 Bonn 1 - Postfach 8361

Federal Communications Commission
 Attention:
 The Honorable Dean Burch,
 Chairman

Washington, D.C. 20554

Ihr Zeichen
 Votre référence
 Your reference

Ihre Nachricht vom
 Votre lettre du
 Your letter of

Meine Nachricht vom
 Ma lettre du
 My letter of

Mein Zeichen
 Ma référence
 My reference

Bonn

II Ka 4214-0/20

November 17, 1970

Betreff/Objekt/Subject

Dear Mr. Burch,

A meeting was held in Munich on November 2 and 3, 1970, at the suggestion of several European administrations. During this meeting principles were discussed which, from the European point of view, appear to be important as regards the telecommunication policy for the traffic relation Europe-North America. On behalf of the following administrations and operating agencies, I am sending you, attached to this letter, the principles which were worked out and agreed upon jointly as result of the meeting: Austria, Radio-Austria, Belgium, Denmark, Finland, France, Great Britain, Greece, Ireland, Italy, Italcable, Netherlands, Norway, Companhia Portuguesa Radio Marconi, Compania Telefonica Nacional de Espana, Sweden, Switzerland, Radio-Suisse, Yugoslavia. I wish to state that my Administration also supports these principles with regard to the whole traffic routed from this country to North America.

At the Munich meeting it was noted that the US Government was also considering the same question (FCC docket no 18875 of June 10, 1970). Clearly any decisions regarding operation and technique, in particular with regard to the traffic relations between Europe and North America, are only conceivable by mutual agreement of all partners concerned. All telecommunication administrations and operating agencies must endeavour to apply technical and operational solutions which make it possible to provide the users with traffic routes on terms which are as favourable as possible.

—The aforementioned European administrations and operating agencies are therefore of the opinion that joint discussions on the questions which are of mutual interest are indispensable. They therefore propose in accordance with the annex under item 2, that a meeting be

held

held during which the policies of Europe and North America should be harmonized and a cable laying programme for the next decade should be drawn up. Since each suggestion for a solution involves the whole traffic area, it would be desirable that, in addition to the representatives from FCC and possibly the representative of the State Department, all interested administrations and operating agencies on both sides of the North Atlantic participate in such a meeting. The administrations and operating agencies represented at the meeting in Munich are of the opinion that such a meeting should be held if possible before the end of this year and offer their good services for the organization of such a meeting.

On behalf of the aforementioned administrations and operating agencies I am sending copies of this letter to COTC, ATT, ITT, RCA, WUI and to Mr. Nelson of the State Department.

Enclosure
Principles adopted by
European administrations

Sincerely,

For the Minister

Prof. Dr.-Ing. Pausch

Principles adopted by European administrations regarding
the provision of new Transatlantic transmission media

1. The European administrations have an equal interest in promoting the further development of the satellite techniques on the one hand and cable techniques on the other. The two transmission media complement each other. The development of satellite networks is being discussed by Intelsat of which nearly all European administrations are members. The following principles therefore also take into consideration the facilities offered by the satellite network.
2. The provision of further Transatlantic cables is necessary to provide diversity of facilities for telecommunications with North America. Accordingly the European administrations and authorized private agencies desire to work out with the North American carriers an agreed cable programme covering the next decade, based on that proportion of foreseen requirements which, following joint agreement, should be provided by cable.
3. There should be no fixed proportion in the use of cable and satellite capacity; the proportion of cable or satellite circuits desired by any European administration will depend on their relative economy, on the need for diversity, on the number of circuits required, on technical, operational and in some cases also on concessional factors. At least for the next five years a cable capacity that will carry 50 % of the total Transatlantic circuit requirement between North America and Europe would however be acceptable as a planning objective.
4. The European administrations are seriously considering a recommendation that any new Transatlantic cable should be owned in equal shares by European and American carriers.
5. The indefeasible right of use of cable capacity in any new cable should be available for purchase at proportionate cost by all European administrations, authorized private operating agencies and by the American carriers by suitable agreements with the parties involved and may be similarly available to other carriers outside Europe or North America.
6. Subject to the agreement of the corresponding holder of rights in the same circuit capacity, and with the prior knowledge of the cable owners, rights may be sold by one administration or authorized private operating agency to another.

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF TELECOMMUNICATIONS POLICY
WASHINGTON, D.C. 20504

December 3, 1970

PRESS RELEASE

Aeronautical Satellite Study Status

The Director of Telecommunications Policy, Clay T. Whitehead, announced today the completion of a study program conducted by elements of the Executive Office of the President chaired by Dr. George F. Mansur, Deputy Director, Office of Telecommunications Policy, which reviewed the entire complex of policy issues involved in several aeronautical program proposals. The study effort included review of various program proposals and extensive discussion with representatives of interested Government agencies, selected aerospace industry organizations, and international airline organizations.

Based on the study, the Director of Telecommunications Policy will prepare a statement of policy guidelines for aeronautical communications satellites and recommendations to the Office of Management and Budget funding. The policy guidelines will be released in the next few weeks.

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF TELECOMMUNICATIONS POLICY
WASHINGTON, D.C. 20504

OFFICE OF THE DIRECTOR

November 17, 1970

To: Tom Whitehead

From: George Mansur

We have also received a letter from Jim Beggs, DOT, on behalf of Secretary Volpe acknowledging receipt of our letters to Volpe. Beggs' letter designated Deputy Assistant Secretary Parker and FAA Associate Administrator Bakke to be the DOT point of contact with the working group and the letter also attached draft answers to our questions. His letter closes with the statement, "In the meantime, please do not hesitate to contact us for any further information you may require." I will acknowledge Beggs' letter.

November 18, 1970

Mr. George M. Low
Acting Administrator
National Aeronautics and Space
Administration
Washington, D. C. 20546

Dear Mr. Low:

Thank you for your letter of November 6, which transmitted the Memorandum of Understanding between the Department of Transportation and the National Aeronautics and Space Administration concerning aeronautical satellite programs. The Executive Office Working Group has had a very good response from both industry and Government agencies, and I would especially like to compliment NASA on its presentation.

As noted in my earlier letter to you, the Working Group expects to complete its preliminary work before the end of November and we shall keep you informed relative to the outcome. I am confident that our common objective is to provide the benefits of space technology to the aeronautical and maritime communities and that a mutually beneficial program will evolve from our collective efforts.

Sincerely,

Clay T. Whitehead

GMansur/tw
Subj File
Reading File
CTWhitehead ✓



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

WASHINGTON, D.C. 20546

OFFICE OF THE ADMINISTRATOR

NOV - 6 1970

Honorable Clay T. Whitehead
Director
Office of Telecommunications Policy
Executive Office of the President
Washington, D.C. 20504

Dear Dr. Whitehead:

A Memorandum of Understanding (MOU) executed between the Department of Transportation (DOT) and the National Aeronautics and Space Administration (NASA) on Satellite Systems for Aeronautical and Maritime Services is attached to this letter. The MOU, in my judgment, satisfies the early requirements for aviation communication improvements, demonstrates the L-band technology, establishes a preoperational system for communications and independent surveillance consistent with DOT/FAA requirements, and provides for international participation and cost sharing in a new space application. This MOU is our preferred way of meeting DOT and NASA objectives and the DOT/FAA requirements.

The most promising approach to the solution of projected aeronautical problems lies in the early application of satellite technology, initially using a VHF system to solve the communication problems and in parallel moving as rapidly as possible to L-band systems to solve the combined communication and surveillance requirements in the latter half of the 70's for both aeronautical and eventually for maritime use.

The rationale for this approach is as follows:

- A. The airlines and DOT/FAA have had experimental satellite communications experience at VHF beginning in 1966 with NASA Applications Technology Satellites (ATS) -1 and -3. Satellite-compatible VHF avionics have been developed and are available to solve the most immediate communication problems.
- B. Congestion in the VHF bands will ultimately lead to serious interference problems, whereas the aeronautical L-band region is relatively free of this difficulty. Because this is particularly true in Europe, there is strong opposition by European governments to any application of VHF in the Atlantic.
- C. The aeronautical L-band has a much greater bandwidth than VHF. In addition to providing the necessary communications capability for the increased air traffic requirements of the late 70's

and early 80's, this larger bandwidth can also accommodate shipping traffic.

- D. The accuracy required of independent surveillance compatible with future reduced lane and track separations anticipated for 1978-80 can be realized easily at L-band, but only with a network of calibration stations at VHF, yielding less reliability for substantial additional cost.
- E. The urgent need for additional communications services consisting of three voice channels in the Pacific beginning in 1973 could be met using existing satellite designs and VHF technology. This need has been expressed by the airlines and the FAA and supported by DOT and NASA.

Inclusion of some L-band capability in the Pacific in the 1973 time-scale will provide an opportunity for: (1) developing experience and confidence in L-band communications and surveillance at the earliest possible time necessary for further refinement of the characteristics of the preoperational system (there is, however, adequate definition of requirements and technology to proceed with the preoperational satellite design now); and (2) developing some of the operating procedures in surveillance and traffic control for use with preoperational and operational systems.

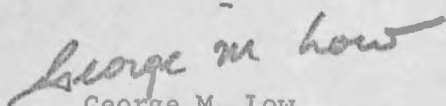
- F. In order to prepare for the anticipated operational requirement in the late 70's there is an urgent need to develop the necessary technology and to conduct systems experiments with L-band preoperational satellites. These satellites, incorporating this developed technology, must be available by about 1975 to provide experience appropriate to 1978-80 operational systems decisions.
- G. Early cooperative international participation in preoperational system experiments is desirable in order to:
 - (1) Establish a basis for the necessary international agreement in ICAO on characteristics of an operational system; and
 - (2) Achieve the benefit of cost sharing arrangements.

Use of the hybrid system in the Pacific shows an early commitment to L-band preoperational testing on the part of the United States. The cooperative international program will proceed concurrently with initiation of the hybrid system but toward a 1975 launch date, and will develop an L-band preoperational system consistent with DOT/FAA requirements.

The NASA support for a hybrid system in the Pacific is predicated on its integral relationship to the Atlantic preoperational systems experiment, since the hybrid mode is not otherwise required and would not be cost effective for the immediate communications requirement in the Pacific.

NASA, and, I am sure, DOT, will be pleased to work with you in formulating policy for satellite systems for aeronautical and future maritime services.

Sincerely yours,

A handwritten signature in cursive script that reads "George M. Low".

George M. Low
Acting Administrator

Attachment

MEMORANDUM OF UNDERSTANDING

Between

DOT AND NASA

Satellite Systems for Aeronautical and Maritime Services

An integrated DOT/FAA/NASA Program to develop improved communications and surveillance services for aeronautical and maritime use in the oceanic regions is hereby established.

The objectives of this program are:

1. To improve air-ground communications in oceanic areas.
2. To reduce aircraft separation standards in oceanic areas.
3. To provide digital communications capability for a wide range of services.
4. To provide for a foreseen requirement for independent surveillance for air traffic control in areas of high traffic density.
5. To provide for the currently evolving requirement for maritime communication, navigation and ship location.
6. To recognize the need for international cooperation in aeronautical satellite systems and take advantage of international interest and cost-sharing possibilities.

The need for improved communications and control for aircraft in the Pacific Region is immediate. The need in the Atlantic is

anticipated to be critical by 1975. The timetable for the maritime requirement is currently being developed. The most promising approach to the solution of these problems lies in the early application of satellites in conjunction with appropriate ground and user equipment.

To satisfy the above objectives and associated need dates, an integrated program has been developed by DOT/FAA/NASA. This program consists of two parts: (1) providing "hybrid" (VHF and L-band) satellite capability* in the Pacific, and (2) L-band satellite capability in the Atlantic.

The "hybrid" capability will be established over the Pacific in 1973 to provide:

1. The early communications services required.
2. Additional data on the relative performance of VHF and L-band under comparable conditions.
3. Early opportunity for DOT/FAA to develop and implement some of the operating procedures in aircraft communications and control for use in preoperational and operational systems, and to perform surveillance experiments.
4. Early opportunity for DOT/FAA and the airlines, both U. S. and international, to develop the avionics and ground equipment

*This could be provided by two satellites having both VHF and UHF equipment on the same platform or by four separate satellites, each carrying one of the two frequency band equipments.

required for use with L-band systems.

5. Experience and data for final design refinements to the preoperational system required by DOT/FAA.

In order to assure an adequate evaluation of such a system, it will be necessary, prior to the initiation of the program, to reach an agreement with the airlines regarding the extent of their participation and the number of aircraft which will be equipped with VHF and UHF capability.

The planned "hybrid" capabilities are:

	<u>VHF</u>	<u>L-band</u>
Channel Capacity	3 voice	1 voice, 1 surveillance
Effective Radiated Power	24 dbw/voice channel	38 dbw/voice channel
Coverage	Earth-disk, 1 db contour	8° circular, 3 db contour
Aircraft Antenna Gain	0 db	3 db
Link Reliability		99% nominal
Signal Quality	44 db-Hz worst case minimum	
Life in Orbit		5 years
Launch Vehicle		Thor Delta

The hybrid satellite services will be funded by DOT/FAA with advice and assistance from NASA. NASA will be a cooperative experimenter with the hybrid. Maximum use will be made of ATS-5 and -F to support the testing where appropriate.

The L-band capability will provide over the Atlantic in about 1975 to:

1. Demonstrate effective L-band systems operation consistent with DOT/FAA needs.
2. Provide the additional communications capacity needed for the Atlantic region.
3. Provide additional systems experiments which are required prior to commitment to operational use of advanced technology.
4. Gain more extensive preoperational experience.

Advanced satellite technology will be used to meet the system objectives in a cooperative international program which will be developed by NASA and ESRO on behalf of the United States and Europe, respectively. For the United States, DOT/FAA will develop and provide avionics and air traffic control center equipment as part of its role in the program. DOT/FAA and European aviation authorities will participate in the program as cooperative experimenters.

The NASA/ESRO program will proceed concurrently with the initiation of the hybrid system, however directed toward a 1975 launch date, and will develop an L-band preoperational system consistent with DOT/FAA requirements noted below. This system will provide a significant increase in satellite capability over that intended for the earlier Pacific use. Two satellites are planned.

The capabilities of the L-band satellite will be maximized consistent with a Thor Delta launch vehicle and an early launch date.

The minimum target L-band satellite characteristics to be met in the NASA/ESRO program are:

Channel Capacity	4 voice channels plus surveillance
Coverage	Earth capability; coverage adaptable to traffic density needs
Aircraft Antenna Gain	3.5 db
Link Reliability	99% nominal
Signal Quality	45 db-Hz worst case minimum
Life in Orbit	5 years
Launch Vehicle	Thor Delta
Eclipse Capability	Surveillance only
Maximum Aircraft RF Power	500 watts maximum

In order for the operational system to provide the most economical service, it is highly desirable to increase the performance capabilities of the L-band satellites beyond the minimum target specifications listed, but remaining compatible with a Thor Delta launch vehicle and an early launch date. It appears that considerable performance improvement over the above minimum specifications can be accomplished by the application of high gain multiple-beam antenna technology, unfurlable solar arrays, and increased efficiency L-band transponders.

The system definition studies in the NASA/ESRO program will be directed to use the above technologies in maximizing the capabilities of the space segment unless design tradeoffs show them to be so technically or economically disadvantageous as to be unacceptable.

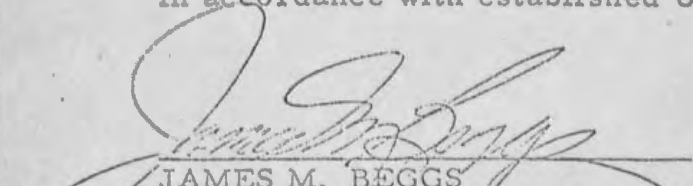
The preliminary cost-benefit analysis will be updated as traffic

projections are revised and as knowledge of user equipment cost is refined by L-band equipment development. This analysis will also be broadened to include potential additional benefits possible with extension of satellite services to shipping. This activity will be conducted by DOT/FAA with advice and assistance from NASA.

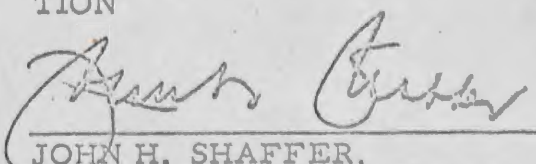
For the United States, the final specifications will be a joint DOT/FAA/NASA responsibility. NASA will proceed immediately to obtain agreement with ESRO on the above.

AGREEMENT

DOT/FAA and NASA agree that the integrated national program outlined herein is the preferred way to meet the objectives and requirements stated and is in the best interests of the United States. DOT/FAA and NASA agree to support this integrated plan according to detailed procedures which will be established consistent with the policies of both agencies. This plan is to be communicated to and coordinated with all appropriate national and international organizations in accordance with established U. S. policies and procedures.



JAMES M. BEGGS
UNDER SECRETARY,
DEPARTMENT OF TRANSPORTATION



JOHN H. SHAFFER,
ADMINISTRATOR, FEDERAL
AVIATION ADMINISTRATION



GEORGE LOW
ACTING ADMINISTRATOR, NATIONAL
AERONAUTICS AND SPACE ADMINISTRATION

70-20-70

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF TELECOMMUNICATIONS POLICY
WASHINGTON, D.C. 20504

*File
Aero Sats.*
DIRECTOR

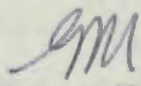
October 5, 1970

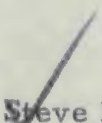
cc: also to Col. Olsson

MEMORANDUM TO THE FILE

Subject: Visit of Messrs. Raymond J. Serradeil and Grebil,
Thursday, October 1, 1970

Messrs. Serradeil and Grebil from the French Embassy met with Dr. Whitehead and Dr. Mansur briefly on October 1. Mr. Serradeil is the Scientific Attache from the French Embassy, and Mr. Grebil represents the SCIATT, which is reported to be the French equivalent of the U. S. FAA. The topic of discussion was the U. S. plan to implement aeronautical satellites. The meeting was very low key and the principal reason for their visit was to determine who in the U. S. government would make the major decisions for aero-sat. Dr. Whitehead explained that the requirements for the program were generated by the FAA and that the FAA/DOT would be responsible for implementation of the program. We also informed them that OTP planned to review the program on behalf of the Executive Branch of the government and would produce recommendations prior to the end of the calendar year. We further indicated that this timing was compatible with the budget review cycle and that OTP's recommendations could be expected to affect fiscal planning.


George F. Mansur

cc:  Steve Doyle

GFMansur:jm

P. 2

September 22, 1970

Dear Mr. Volpe:

We have followed with interest the development of DOT/FAA requirements for air traffic control utilizing satellite communication links. The Office of Telecommunications Policy shares your opinion that there is a great and largely undeveloped potential for satellite services for a broad class of users which, of course, includes civil and military aviation. In order to assure timely and useful development of satellite systems for these purposes, and to assure consistency with U. S. international policies and national security objectives, it is important to establish a definite statement of the Administration's policy in this area.

Since this is a responsibility of the new Office of Telecommunications Policy, we plan to begin immediately an Executive Office effort to formulate an Administration position concerning technical and institutional arrangements related to deployment of satellite communication and navigation systems. Although it is inappropriate for OTP to be part of the recently formed FAA/NASA group chaired by Mr. Bakke, we expect that group's conclusions will be an essential part of the broader effort by providing a definite statement of FAA requirements and the rationale for proposed DOT and NASA programs.

I recognize the urgency of the ATC problem and its relation to fiscal planning and wish to assure you that our schedule will be compatible with OMB FY 72 budget reviews. Representatives of OET, DOS, NASC staff, and NSC will be involved in the Administration's policy review. Dr. George F. Mansur who has been nominated to be Deputy Director of OTP, will be directing this activity. I would appreciate it if you could designate a DOT/FAA representative with whom Dr. Mansur can discuss DOT views.

-2-

We look forward to working with DOT/FAA in this activity and hope that our joint efforts will result in early deployment of a system(s) compatible with the needs of industry, FAA, and other Federal agencies.

Sincerely,

SIGNED

Clay T. Whitehead
Director

Honorable John A. Volpe
Secretary
Department of Transportation
Washington, D.C. 20590

cc: Clay T. Whitehead
Central Files
Col Olsson

GF Mansur/tw

-2-

Accordingly, I would like to convene an Executive Office working group to review current and proposed plans, and to develop the Administration's policy for aeronautical satellite systems and other complementary uses. I would like to invite you to designate a representative to participate in this effort. Dr. George F. Mansur who has been nominated as Deputy Director of OTP will be directing this activity.

SIGNED

Clay T. Whitehead
Director

cc: Dr. Russell Drew

Mr. Whitehead
Central Files

GMansur/tw
GMansur Reading File

Identical memos forwarded to the following:

Honorable George Shultz, OMB (cc: Nick Stoer)
Honorable William Anders, NASC
Dr. Henry Kissinger, NSC (cc: Col. Robert Behr)

Letter to: Honorable Wm. P. Rogers, Dept of State (cc: Bertram Rein &
Robert Packard)

~~GPM~~
File-
Aero Satellites

Geo-

Are you to be the designee?

Do you want me to draft reply?

Steve

Steve - Brooke has been contacted by phone and told that we will not participate in his activity. I think the phone call is better than a memo under the circumstances.

Our intent per CTR is to convene a second group from the executive offices to review the FAA/NASA output plus others i.e. DOD etc.

GPM

3
9/8/70
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

WASHINGTON, D.C. 20590



9 - SEP 1970

Mr. Clay T. Whitehead, Director
Office of Telecommunications Policy
Executive Office of the President
Washington, D. C. 20504

Dear Mr. Whitehead:

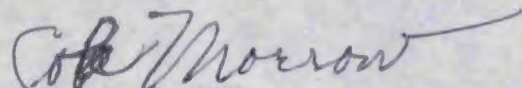
On 28 August and 3 September 1970 the Under Secretary of Transportation, the Administrator of the National Aeronautics and Space Administration, and others met for the purpose of discussing programs for aeronautical satellite development (see enclosure).

One result of the 28 August meeting was a decision to establish a working group consisting of members of DOT/FAA and NASA. In addition, it was agreed that an invitation should be extended to the Office of Telecommunications Policy, the National Aeronautics and Space Council, and the Department of Defense.

The goal of this working group is to ensure that proposed programs provide a logical and economic progression through the several levels of development in aeronautical communications satellite systems and correlate with user requirements.

In view of the foregoing, you are cordially invited to participate as a member of the working group. In anticipation of an early meeting, it would be appreciated if you (or your designate) would acknowledge your acceptance as a member of the working group as soon as possible.

Sincerely,

for 
OSCAR BAKKE
Associate Administrator for Plans

Enclosure





THE UNDER SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590

SEP 4 1970

Honorable Thomas O. Paine
Administrator
National Aeronautics and
Space Administration
Washington, D. C. 20546

Dear Tom:

This is written to confirm the agreements reached at our meetings on August 28 and September 3, 1970, concerning aeronautical communication satellite programs of the Federal government. I would, first of all, thank you for what was a very constructive exchange and to assure you of our desire to cooperate in any way possible in the development of complementary programs that will receive the confidence of the aviation community, the Office of Management and Budget, the Congress, and the public at large.

We agree with your observation that the L-band program under consideration by NASA/ESRO or the hybrid VHF/L-band proposal under consideration by the Department of Transportation are not mutually exclusive provided, of course, that we are sufficiently attentive to the details of each program so as to avoid unnecessary duplication while ensuring an integrated effort. Furthermore, I believe it quite likely that the detailed work statements and project descriptions of the two programs can be correlated in such a way as to ensure a logical and economic progression through various developing levels of communication satellite technology.

I am agreeable, therefore, that DOT and NASA should immediately constitute a working group for the purpose of developing such mutually supportive programs and would propose that Mr. Oscar Bakke, Associate Administrator for Plans, FAA, chair this working group.

The participating organizations should include the Office of Telecommunications Policy, the National Aeronautics and Space Council, and the Department of Defense in addition to NASA and DOT/FAA.

On the assumption that this arrangement would be satisfactory to you, I have instructed Mr. Bakke to proceed immediately to contact prospective members of the working group in preparation for an early meeting. I have also instructed the FAA to develop and put in your hands as soon as practicable the necessary working papers describing the proposed DOT programs so that your review can begin without delay. In addition, the updated DOT policy, now being finalized, relative to aeronautical satellite development is included as an enclosure to this letter; this paper should clarify any previous misunderstanding which may have existed between FAA and NASA on the subject. Copies are also being forwarded to OTP, NASC and DOD. May I ask that, similarly, any corresponding NASA documentation not already available to us be sent to Mr. Bakke for our review as soon as possible.

I am hopeful that the working group will reach quick agreement on a program that will permit a commitment by the Administration to the early initiation of an aeronautical communication satellite and bring to an end the appearance of disunity both at home and abroad.

Cordially,

Jim

Enclosure

Department of Transportation

Federal Aviation Administration

Policy for
Aeronautical Satellite Development

1 September 1970

Policy for
Aeronautical Satellite Development

I. Introduction

The purpose of this paper is to provide an updated policy and plan for utilization of aeronautical satellite techniques for providing services to air traffic in oceanic areas. Factors considered include:

- (1) Operational Requirements and Systems Development
- (2) International Coordination and Cooperation
- (3) Fiscal and Economic Considerations
- (4) Research and Development Requirements
- (5) Responsibilities

Background

Air traffic is increasing in the oceanic areas. Traffic forecasts indicate a continuing growth in traffic which will result in a commensurate increase in demand for aeronautical communications. Basic planning for aeronautical communications utilizing the HF (high frequency) segment of available radio spectrum was concluded in the 1940's. In the more than 20 years that have elapsed since that time, progress in technology for oceanic

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applications has been modest, to this point in time; consequently, saturation of existing HF communications channels in both the Atlantic and Pacific can be forecast to occur in the 1973 to 1975 period. It is not, however, the need for increased capacity in communications alone that will become critical, but the need for a reliable link to tie the many parts of the air traffic system together in order to exploit system capability to its fullest.

In attempt to alleviate the potential problem areas just mentioned, consideration of satellite applications for aeronautical purposes has been investigated by several organizations and Governments. The scale of these investigations range in scope from basic communications improvement to that of development of sophisticated oceanic air traffic control systems. It is with these two parameters that the following agency position for aeronautical satellite applications has been developed.

National requirements for applications of aeronautical satellites have been stated.^{1/} Further, a National Plan for aeronautical satellite applications has been developed.^{2/} In essence, the requirements are:

^{1/}

Statement of Requirements, IGIA 77/1.29F 4 Sept. 1968

^{2/}

National Plan, IGIA 77/1.31C 13 Nov. 1968.

1. To improve air-ground communications in oceanic areas through direct pilot-to-controller capability and between the aircraft and ground for operational control.
2. To reduce aircraft separation standards in oceanic areas.
3. To provide digital communications capability for a wide range of services.
4. A foreseen requirement for independent surveillance for air traffic control in areas of high traffic density.

The National Plan contemplates that the foregoing requirements can be met through a three-phased program involving:

1. A Developmental Period in which there would be:
 - a. An operational evaluation of VHF voice and data communications.
 - b. An evaluation of automatic reporting techniques.
 - c. Evaluation of VHF ranging.
 - d. Development of UHF (L-band) user equipment and evaluation of UHF voice and data communications and position determination.
2. A Transition Period in which basic system decisions should be made based on results of the Developmental Period.
3. The Operational Period in which worldwide implementation of a full capability system should be accomplished.

The time phasing of the National Plan completed in late 1968 contemplated that the Developmental Period would extend from 1968 to 1973; the Transition Period from 1973 to 1975; and the Operational Period from 1975 to 1980. At the present time, these goals are lagging by about two years. The first launch of a VHF preoperational satellite was scheduled for 1970. Since it requires at least two years to design and build a satellite, this would place a first launch in late 1972 or early 1973.

With the foregoing as a background, the following represents the FAA plan for achieving the National objectives.

II. System Functional Scope

The Council of the International Civil Aviation Organization, on the basis of recommendations made at Regional Air Navigation Meetings where both "Provider" and "User" States are represented, designates States having interest and capability as responsible for providing air traffic services in the oceanic areas of the world. A wide range of services is provided. These include positive air traffic control, communications, meteorology, and search and rescue coordination. Regional Meetings are prohibited from making recommendations for facilities, services or procedures which are in conflict with ICAO Standards and Recommended Practices or Procedures for Air Navigation Services.

The system is composed of:

1. Personnel: air traffic controllers, communications specialists, flight crews, airline and military operations specialists, meteorologists, and other specialists, and
2. Facilities: air traffic control centers, air-ground communications stations, point-to-point communications, aircraft, navigation aids, search and rescue, and ancillary facilities.

The critical component in the system is the communications links.

These links, of and by themselves, would not serve a useful service; it is the parts of the system that are tied by the communications links that justify the need for such communications and from which emerge an entity -- the air traffic control and the operational control systems.

III. Operational Requirements

From the foregoing, it can be concluded that an oceanic air traffic system requires adequate communications links to tie the several component parts together. Existing air/ground communications links are inadequate in both the North Atlantic and North Pacific Ocean regions. Because of the primary responsibility of the United States for provision of air traffic service in four of the five areas of the North Pacific Region, and the controversy which surrounds the subject of satellite communications among the states of the North Atlantic Region, this statement will address itself exclusively to the North Pacific Region and the ICAO Flight Information Areas in which the U. S. provides air traffic services (Tab A).

1. Voice Communications. Improvement in air-ground communications will alleviate congestion in the existing HF and extended range VHF capabilities. This in itself can result in more efficient utilization of the airspace. In addition, pilot-to-controller capability presents an initial step toward reducing en route separation. Verification of accuracies in airborne inertial navigation systems would present another step toward such separation reductions.

Improvement in voice air-ground communications capability is required within approximately two years due to the previously mentioned forecast of HF air-ground saturation. Initially, three channels would be allocated to the several ATC facilities and airline company communications facilities involved. Specific operational plans have been proposed and finalized plans must be established prior to decisions on communications capability.

2. Data Communications. Although voice communications will be required for non-routine and emergency communications, digital data communications can offer a significant amount of automation in oceanic air traffic control and operational control and provide

for more efficient use of communications channels. The technology for digital data systems is established and is now ready for an evolutionary development with the ultimate goal of achieving ICAO standardization and introduction into service as a part of the future air navigation system. Operational improvement can be expected in at least three areas of concern:

- a. The air traffic control system
- b. The in-flight system which includes the aircraft and sub-systems
- c. Ground aircraft management systems.

Taken in order are those requirements related to each of the foregoing areas, above.

a. Air Traffic Control Systems

Automatic reporting of aircraft position derived from self-contained (e. g., inertial) navigation systems and altimeter digitizers. As a minimum, the digital data report would include:

- (1) aircraft identification
- (2) position in latitude/longitude
- (3) Pressure altitude

The link over which these data are transmitted would be one of the satellite channels which was used initially for voice communications and which could now be a dedicated data channel.

Data processing in the ground ATC environment will be required to translate this to real-time displays and to extrapolate data for estimates to the next fix.

This capability should be available by 1975 in order to alleviate communications congestion and reduce pilot/controller workload.

In parallel with digital data development is a requirement to determine potential reduction in separation standards which can be expected to result from operational application of such techniques.

b. The In-flight System.

Input/output devices on the flight deck are available to provide visual (record copy or display) of air traffic clearance and operational messages. Voice communications will be reduced to a minimum thereby reducing the number of voice channels which would be required in the fully operational aeronautical satellite system. This development should be in parallel with the development in digital data ATC systems in the preceding paragraphs.

c. Ground Aircraft Management Systems.

Essentially the responsibility of the aircraft operators, this development effort is mentioned here to illustrate the potential benefit

which could accrue to the users of aeronautical satellite systems. Improvement can be expected in several areas such as airline operational control; maintenance, through processing of data collection of on-board sensors; airline company traffic messages; and company accounting through automatic collection of aircraft utilization data.

The introduction of the wide-bodied jets (and eventually the SST's) provides motivation to the airline industry to exploit data systems to the maximum in order to realize highly efficient fleet management and the cost savings which will result therefrom. In addition, these data systems can be expected to reduce in-flight systems emergencies and improve safety records.

3. Independent Surveillance. Surveillance of oceanic air traffic through satellite techniques could provide an air traffic control system analogous to the radar system employed in domestic ATC. Precise position determination together with improved navigation and communications capability could provide the basis for very significant reductions in en route separation standards. The point in time at which such reductions will be required has been estimated but consensus has not been reached. In the absence of a specific time at which surveillance capability is estimated to be required,

the following position emerges. It is generally agreed that surveillance may eventually be required, therefore developmental work should begin with the initial satellite planning. The several techniques for providing surveillance should be investigated and ATC displays should be developed together with ATC procedures and ancillary equipment development. In short, an orderly development should take place so that when required, the system can be inaugurated. As the limits of earlier systems are reached and a clearer picture of traffic demand emerges, a more accurate management decision can be made toward an ultimate air traffic control system.

4. Navigation. Specific requirements for passive navigation have not emerged, however they must be considered in the light of potential DOD requirements and maritime requirements. The Department of Transportation National Plan for Navigation provides the most current statement of long range navigation policy and planning and for that reason is not restated in this position paper. Current airline policy is summarized as preference for self-contained navigation systems and opposition to use of independent passive systems.

IV. International Factors

There is a division of opinion internationally relative to the essential characteristic and operational requirements for aeronautical satellite services.

By virtue of the Convention on International Civil Aviation, ICAO is charged with the responsibility of determining the facilities and services essential to international civil aviation. ICAO, which is an arm of the United Nations, has a principal body called the Assembly. The governing body of ICAO is the Council. The Council is supported by the Air Navigation Commission (ANC) and several standing Committees.

Resolutions adopted by the Assembly, such as those defining the jurisdiction, policies, and principles to be followed by ICAO, are binding on the Council and all ICAO Member States.

Due to the advent of space technology, the Assembly, at its Sixteenth Session, Buenos Aires, September 1968, found it appropriate to develop a resolution concerning the role of ICAO in coordinating international civil aviation activities involving space applications. In this regard Resolution A 16-11, covering points pertinent to applications of space technology to meet operational requirements is quoted below:

"The Assembly:

RESOLVES that ICAO be responsible for stating the position of international civil aviation on all related outer space matters, and for stating international civil aviation's particular requirements in respect of applications of space technology;

REQUESTS the Council to take such measures as may be necessary to establish these positions and requirements."

Equipment specifications in some cases including an application standard, (Standards and Recommended Practices - SARPS) and Procedures for Air Navigation Services (PANS) are developed at ICAO Divisional type conferences. After consultation with all ICAO Member States, these are approved by Council for incorporation in ICAO Annexes and PANS documents for application on a worldwide basis. Operational requirements for facilities and services and the techniques for meeting those requirements are developed within the framework of ICAO SARPS and PANS for specific regions by ICAO Regional Air Navigation Meetings of "Provider" and "User" States in the form of recommendations to Council. After review by the Air Navigation Commission, these recommendations are approved by Council and constitute the ICAO Air Navigation Plan for each region.

ICAO encourages States and International Organizations to make known their views and participate in the formulation of worldwide ICAO SARPS and PANS at Divisional type conferences or through correspondence consultation and to translate these SARPS and PANS into Air Navigation Plans of operational requirements, facilities and services at Regional Meetings. Unilateral introduction of new or different equipment specifications or application of techniques which have not been agreed through the prescribed ICAO process cannot be imposed on other States or aircraft registered in other States.

With respect to satellite applications for civil aeronautical services, the international community, at present, appears to be in somewhat of a dilemma. That is, while the ASTRA Panel has been established to determine the essential characteristics of a system which could be applied to meet established or foreseen worldwide operational requirements, there is as yet no agreement on the application of space technology to meet these requirements in any ICAO Region.

It is also noteworthy that the North Atlantic Fifth Regional Air Navigation Meeting, April 1970, adjourned without recommending use of space technology for meeting the operational requirements. In the absence of ICAO SARPS on satellite techniques, the meeting could do nothing else. This meeting, under Agenda Item 3, Long-term Systems

Plan, did identify elements to be taken into account in long-term systems planning but none of the elements concerning satellite applications was classified as a "definite requirement within a specified time scale." All considerations of possible satellite applications were placed in a category "requiring further study" or in a category "for which the meeting can, as yet, draw no firm conclusion." Accordingly, ICAO has recommended continuing effort of satellite communication and surveillance experiments in both the VHF and UHF bands.

ICAO has recommended continuing effort of satellite communication and surveillance experiments in both the VHF and UHF bands -- through a formal communication to the United States from the Secretary General (Tab B). This communication expressed the hope that if the U. S. were able to respond to the ICAO view that it would be:

de "highly desirable for the satellite in question to be dedicated to the greatest possible extent to aeronautical experiments and to carry both L Band and VHF transponders, so that the most effective comparison between the relative merits of these competing bands could be made, either simultaneously or, if necessary, on an alternating basis."

In view of the above observations it is concluded that during the near future there will be no agreement within ICAO to apply space technology to meet operational requirements in any Region.

It is apparent that although international coordination is both required and desirable, the initiative in development lies with Member States either individually or in cooperation.

Cooperation in aeronautical satellite development with major European States would be advantageous for a number of reasons. Two powerful reasons are:

- (1) Assistance in financing and technology
- (2) Early cooperation could expedite acceptance of satellite applications into the ICAO framework of standards and procedures.

Unfortunately, the current European view is that a decision on the characteristics of aeronautical satellites, including the radio frequencies to be utilized, should be made immediately. Further it is contemplated that a sophisticated experimental-preoperational air traffic control system should be ready by 1974 or 1975. The expense and momentum generated by such action could preclude consideration of any other characteristics for the ultimate operational system within the ICAO framework.

The current view of the FAA is that a satellite communication link is urgently required to permit system development but it is too early to make a final decision on the essential characteristics of the worldwide operational aeronautical satellite system and that further effort is needed in both VHF and L-band before a decision can be made. The international and domestic airlines currently share this view and have indicated their support for a hybrid VHF/L-band satellite system which can provide some operational use and at the same time, provide comparative evaluation and experimentation/development of L-band.

It would appear that a clear statement of the policy of the United States in this matter is essential and that this policy should indicate an intention to proceed immediately with both VHF and L-band development in order to arrive at the proper decision for future operational satellite systems. In this respect, satellite experimentation in the Pacific may be facilitated by the larger oceanic area involved since there is a degree of risk that a satellite may cause interference to non-participating facilities. There would be fewer States involved with satellite development in the Pacific and there is greater likelihood of achieving cooperation from these States than those in Europe. Early efforts to solicit cooperation of States in the Pacific Area should be initiated; preferably before official statement of intent is issued.

Finally, it should be made clear that European participation is encouraged in development of satellite systems and that deployment of a hybrid satellite capability in the North Atlantic would be favorably considered if it were so requested.

V. Fiscal Considerations

Two alternatives can be considered for financing aeronautical satellite development:

- (1) A service arrangement whereby the FAA and the airlines would lease satellite communications capability.
- (2) A government development program where all space and ground segment equipment would be procured through contractual arrangement.

The first alternative suggests the following advantages:

- (1) No full-funding of a multi-million dollar research and development or facilities and equipment program would be required in any single fiscal year.
- (2) Research and development budgetary requirements would increase only to a limited degree.
- (3) The fiscal impact to the government of a satellite system failure is minimized.
- (4) The leased services would not require expenditure of resources until service was actually initiated. A budgetary commitment would be required in FY 1972; however, no monies are required to be appropriated for such leased services until FY 1973. Further, the lease charges would be extended over a five year period, thus reducing annual budgetary impact.

- (5) Finally, the lease arrangement would be in consonance with the government policy to utilize commercial communications facilities for government requirements whenever possible.

The second alternative, considering a 1973 launch, would require reprogramming of the FY 1971 budget and authorization by the Office of Management and Budget due to the magnitude of the project, or a request to Congress for a supplemental appropriation. Such action would be required for contracts with industry for design, development and production of the satellite program hardware and software, and management of the program.

Presumably, full-funding would be required. This contingency has not been contemplated in aeronautical satellite development by the agency and could present a major problem due to budget deficits forecast by the Administration.

VI. Research and Development

A variety of research and development tasks are essential to both near and long term objectives of an evolutionary aeronautical satellite program. Some of these may be more appropriately performed by other agencies through interagency agreement. The required efforts fall in

three categories: analysis, technology development, and flight experimentation.

Analysis

1. Quantitatively assess the value of relay of on-board positioning data in terms of increases in oceanic system capacity. Specifically evaluate the extent to which further increases in major ocean system capacity can be made through use of inertial navigation, either through lateral or longitudinal reductions. Compare the value of independent satellite surveillance with dependent surveillance (e.g., relay of inertial data). Develop improved mathematical models that relate surveillance accuracy, fix rate, navigation performance to lane spacing, alarm rate, false alarm rate, aircraft dynamics, etc., in order to provide a quantitative assessment of these factors.
2. Develop models that will allow a refined assessment of cost/benefits associated with various functional capabilities provided by satellites. This will require development of subsonic and SST traffic forecasts through the 1985 time period. Major areas of concern to the U.S. involve Atlantic, Pacific, and domestic flights although worldwide requirements must be considered.

3. Based on the above studies, identify the functions to be performed by an operational satellite system including time phasing and coverage requirements for each. These must be established with the close coordination of the ATC and airline communities.
4. Perform a comprehensive analysis effort aimed at continuing refinement of the interrelated characteristics of spacecraft, ground terminal and airborne elements of the system. This will involve, typically, refinement of access techniques employed for voice and data, study of modulation and coding techniques used for communication, error analyses for various techniques possible for position determination. Detailed study of VHF/L-band interference problems and long range frequency growth prospects in areas of required application must be addressed. The tradeoffs associated with joint marine/aeronautical use of a satellite system should be evaluated. Orbital constellations should be optimized to provide the required services. Alternative configurations of ATC jurisdictions must be developed.

Detailed study of alternative networks for information flow between ATC centers, satellite ground stations, airline ground stations, and aircraft must be identified. Based on these an evolutionary plan which will interface the satellite system with the existing oceanic ATC environment must be developed, coordinated through the appropriate international agencies. Oceanic/domestic interfaces should be a part of this effort.

Technology Development

1. Design and develop aircraft equipment necessary for the variety of services anticipated. In the VHF band this should include improvements in designs of aircraft antennas to enhance their multipath rejection capability, allow their application to broader classes of aircraft, and demonstrate better pattern and gain performance. Particular effort is needed to develop a flush-mounted antenna suitable for SST use. Improvements in aircraft transmit/receive units and input/output devices should be developed in close cooperation with ARINC/ATA. At L-band both component and transponder development should be continued. Modular changes to the VHF equipment that would allow operation at L-band should be considered. Hemispherical and switched aircraft antennas should be developed for test. Studies should continue of the feasibility of steerable aircraft antennas including a critical assessment of weight, cost, and maintenance problems. Promising avionics which could allow integrated digital voice, data, and position determination with cost and reliability improvements over combined analog/digital approaches should be thoroughly explored. Equipment development should be initiated for test if promising concepts are identified.

2. Develop improved satellite technology. Emphasis should be given to the development of spacecraft antenna techniques that will allow earth coverage multichannel spacecraft operation at L-band with low recurring channel costs. Particular emphasis should be given to development of phased array antenna technology at L-band for space application. Studies, laboratory model development and feasibility demonstration in a spaceborne environment are important to the long term aeronautical satellite efforts. Improvement in the availability of satellite RF power using solid state components at both VHF and L-band is necessary. More efficient energy conversion in solid state amplifiers is needed particularly at L-band.

Flight Experiments

A great number of flight experiments are required at both VHF and L-band:

1. Substantial data exists on the fading effects of ocean multipath, the noise environment and ionospheric scintillation at VHF. Continued measurements are warranted, particularly with a circularly polarized source. The applicability of existing multipath fading margins, developed with linearity polarized sources, to circularly polarized links should be confirmed by direct

experiment. Continued characterization of a worldwide scintillation model at VHF is essential, developed by a network of ground stations. Experimental verification of the extent to which ionospheric path lengthening can be compensated at VHF is necessary in order to evaluate the limits of position determination performance at this frequency.

2. Fundamental measurements of the noise environment at L-band do not exist at present and must be developed in a realistic airborne environment with typical low gain antennas. Similarly, measurement data are required on the effects of ocean multipath at L-band on communications and ranging system performance.
3. Although some voice and data communications tests have been performed at VHF by the airlines and FAA, much more effort is needed to identify the relation between signal levels and link performance. These measurements should include comparisons at both VHF and L-band of link intelligibility and bit error rate under similar geometric and sea state conditions in order to allow realistic cost/performance comparisons to be made. Similarly, ranging experiments are necessary at both VHF and L-band to determine the limits of performance in both cases.

4. Systematic laboratory and field tests are necessary at both VHF and L-band to quantify the incidence and levels of interference occurring in order to develop a sensible frequency plan in both bands. On a controlled basis, the variety of desired/interfering conditions should be established to verify analytical estimates of protection levels.
5. A number of preoperational tests are required in order to establish procedures to be used in conjunction with satellites for voice/data communications and position determination. Procedures to deal with infrequent but potentially disabling effects such as PCA or extended high-level scintillation should be developed. Access techniques for voice and data channels must be demonstrated in a multiple aircraft environment. Methods must be developed at both the aircraft and ground terminal to make optimum use of the information transferred through the satellite.

The above experiments should be executed at the earliest possible data using existing satellites (ATS-1, ATS-3, ATS-5), high altitude balloons, and other satellites of opportunity where feasible. These measurements would allow an improved understanding of how a first generation system should be designed. Follow-on experiments should be conducted with the full capability first generation satellites.

VII. Responsibilities

The respective roles to be assumed by the FAA and other government agencies now require reconsideration. NASA has research, development, and the advancing of science and technology as its mission, whereas the FAA is more concerned with demonstrating feasibility of and applying already available technologies for operational systems.

The acquisition of the Transportation Systems Center by the Department of Transportation, provides a source of additional assistance to the agency. The talented resources at TSC lie in the disciplines which could be utilized to assist the FAA in evolutionary satellite programs in consonance with operational requirements and the National Plan. Better program management could be achieved if our satellite programs were developed essentially within the framework of the Department. In addition, the agency's efforts and progress would not be dependent on the success of another agency's justification of their budgetary requirements before the Administration and Congress.

In view of the foregoing, and in view of the current schedule of the NASA program, it is the intention of the FAA to reorient aeronautical satellite system development toward Departmental resources and look to other agencies, such as NASA, for longer range research and development programs which will be vital for future systems application. This reorientation should receive the strong support of the airline industry.

VIII. Policy for Aeronautical Satellite Development

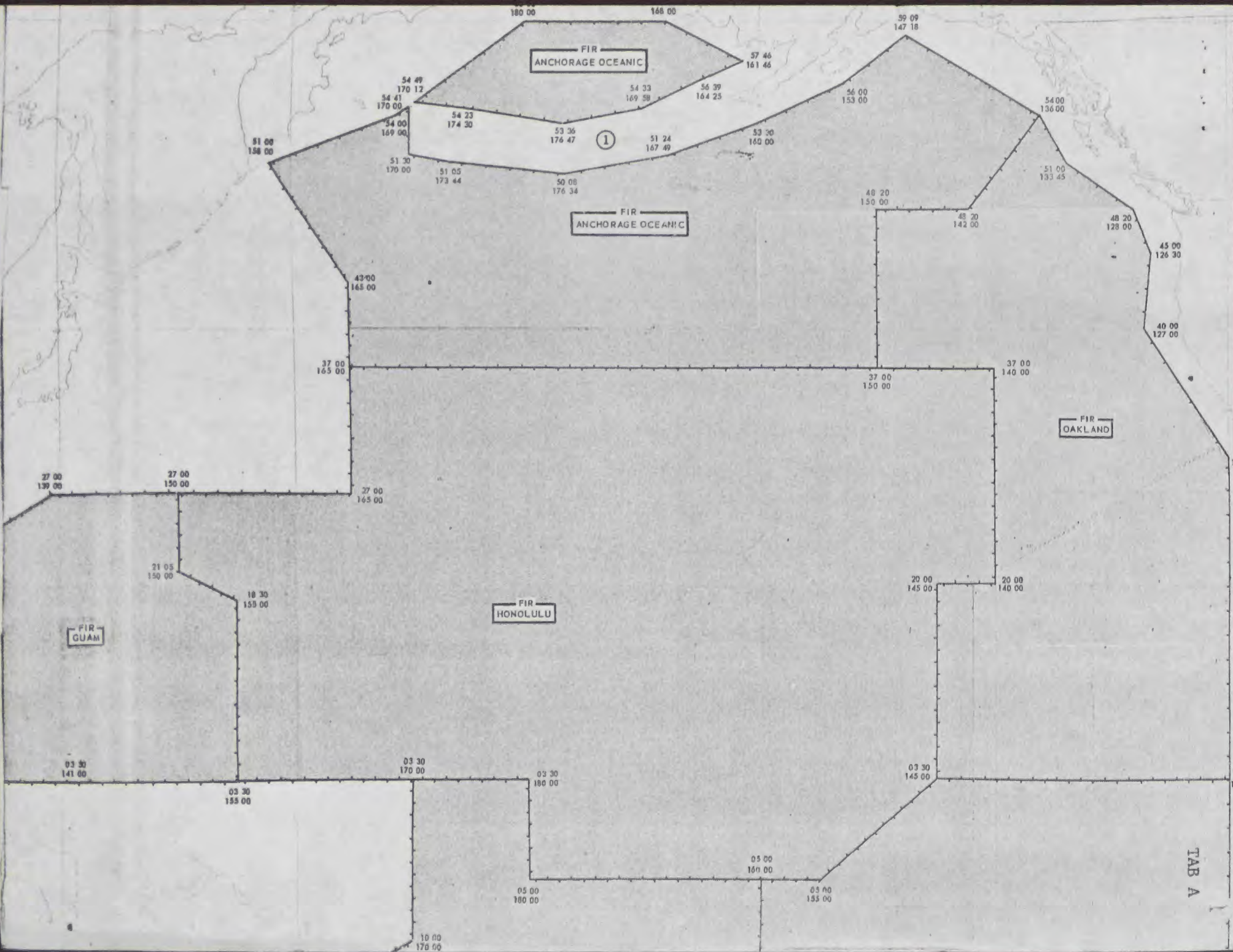
In view of the need to initiate efforts immediately toward alleviating air-ground communication congestion in the areas of the Pacific Ocean in which the United States is solely responsible for providing international air traffic services, and in order that development of the eventual oceanic air traffic and operational control systems for future use in both the Pacific and Atlantic can be expedited by the FAA and participating air carriers from an initial deployment of a satellite system, in addition to acquisition of required experiment and developmental data; the following policy is established.

(1) The foregoing aeronautical satellite development shall be attained through an initial experimental deployment of a preoperational hybrid aeronautical satellite system to serve the Pacific oceanic ATC system. The satellite system should be available by early 1973 at the latest.

(2) A commercial lease arrangement will be utilized to provide a preoperational and experimental program.

(3) Required engineering and development programs must be established to support aeronautical satellite applications and required ground systems and procedures development which will fulfill operational requirements.

(4) Coordination and cooperation with other agencies will be effected to ensure that aeronautical space applications programs are complementary in nature and responsive to requirements.





TAB B

INTERNATIONAL CIVIL AVIATION ORGANIZATION

INTERNATIONAL AVIATION BUILDING
1080 UNIVERSITY STREET
MONTREAL 3, P.Q., CANADA

WHEN REPLYING, PLEASE QUOTE
RÉFÉRENCE À RAPPELER DANS LA RÉPONSE
INDÍQUESE EN LA RESPUESTA ESTA REFERENCIA

SP 25/1

12 DEC 1969

Sir,

I have the honour to bring to your attention certain matters arising from the actions of the Air Navigation Commission on the Report of the Second Meeting of the ICAC "Application of Space Techniques Relating to Aviation" (ASTRA) Panel.

The Panel recalled that at its First Meeting it had been noted with satisfaction that the United States intended to launch the ATS-5 geostationary satellite that would include aeronautical experiments with an L band (1540 - 1660 Mc/s) transponder. These experiments were considered to be of great potential importance in arriving at a decision on the optimum frequency band (VHF or L band) for an ultimate aeronautical satellite system.

It was with great regret that the Panel received confirmation during its Second Meeting that due to a malfunction following launch it has proved impossible to stabilize ATS-5 in such a manner that would permit these important experiments to be carried out. The Panel was further informed that in accordance with the original US NASA program the next opportunity for an L Band aeronautical experiment would be with ATS-F in 1972 or 1973 although the possibility of an earlier substitute for ATS-5 was now being considered.

In the Panel's view the need for aeronautical satellite experiments in the L Band - both for communications and surveillance - is of increasing importance since if it were necessary to await results from ATS-F as originally scheduled, one of two things would need to occur:

either

- a) the time table for the specification, development and deployment of an operational aeronautical satellite system would have to be set back 2 or 3 years, or
- b) the characteristics of pre-operational systems would have to be based on judgements that were not backed by sound technical data resulting from practical experiments.

The Panel concluded that it would be appropriate for ICAC to give every possible encouragement to the United States to launch a satellite that would enable those experiments originally planned for ATS-5 and of interest

to aviation to be performed at the earliest possible date. It was further considered that if the United States were able to respond to such a view of ICAO ~~that~~ it would be highly desirable for the satellite in question to be dedicated to the greatest possible extent to aeronautical experiments and to carry both L Band and VHF transponders, so that the most effective comparison between the relative merits of these competing bands could be made, either simultaneously or, if necessary, on an alternating basis.

In line with the foregoing considerations, the Panel made a recommendation to the Air Navigation Commission that ICAO should communicate with the United States of America with a view to:

- a) expressing regret at the failure of the ATS-5 experimental satellite;
- b) encouraging the launching at an early date of a satellite that would permit the conduct of the aeronautical experiments originally planned for ATS-5;
- c) expressing the hope that if a replacement satellite can be launched, it be dedicated as far as possible to aeronautical communication and surveillance experiments in both the VHF (118 - 136 Mc/s) and L (1540 - 1660 Mc/s) bands, either simultaneously or on an alternating basis;
- d) further expressing the hope that such a satellite would be positioned around 30-40°W to facilitate and encourage active participation by European States in the experimental program.

On 26 November 1969, at the Eleventh Meeting of its Sixty-second Session, the Air Navigation Commission approved the aforementioned recommendation and accordingly I am now bringing it to your attention. I would be grateful if, in due course, you could inform me of any related plans of your Administration.

Accept, Sir, the assurances of my highest consideration.

T. J. Bauer

B. T. Twigt
Secretary General

15 December 1969

Forwarded to W. C. Hannemann, Principal Staff Officer, ICAO, for distribution to the appropriate US agencies pursuant to Rec. 3/1 of the Second Meeting of the ASTRA Panel (Montreal, 20-31 October 1969).

cc: Director OA, Dept. of State.

Charles F. Butler
for Charles F. Butler