CTP policy support and frequency management support requirements for FY 72 and 73, organized along the lines of our own FY 73 program. We would appreciate having a table of this type incorporated in your program memorandum, subject to any minor alterations needed to conform to the format and precise allocation of funds required.

If you would like to discuss any of this material, please contact me at your convenience. We would, of course, like to discuss the final version with you prior to its submission.

SIGT N

Walter R. Hinchman Assistant Director

WRHinchman:dc DO Chron DO Records Mr. Whitehead Dr. Mansur Subj RF

Estimated OTP Support Requirements from DOC/OT - FY 72 and FY 73

Program Areas FY 72 (000) FY 73 (000) . Folicy Support Total. Total A. International Policy Development International Comm. Services 75 40 International Conferences 75 40 Special Projects 50 20 200 100 TOTALS B. National Policy Development Broadcasting & Broadband Services 400 400 Mobile Services 200 100 Bulk & Specialized Services 350 400 New Technology 200 200 Spectrum Allocation Plans & Policy 100 150 Special Projects 200 TOTALS 1250 1450 C. Federal Policy Development Federal Systems and Services 600 350 Special Projects 50 100 650 TOTALS 450 D. State and Local Planning Assistance 200 100 100 TOTALS 200 II. Frequency Management Support Frequency Management Services 1000 1200 Spectrum Engineering Services 500 400 Electromagnetic Compatibility Dev. 600 450 Computer changeover(non-recurring) 300 2600 TOTALS 1850 GRAND TOTAL 3750 5100

November 17, 1971

Memorandum for:

Mr. Robert Lowe Office of Telecommunications Department of Commerce

Now that the Policy Support Division staff and programs are beginning to take shape, it appears that somewhat more formal arrangements may be needed to ensure effective coordination of our respective activities. The attached paper sets forth interim terms of reference and coordination procedures designed to meet this objective. If these are acceptable, I propose they be implemented immediately and made known to our respective staffs.

Additionally, I would like to obtain some details on the current status of PSD staff and programs for use in planning further joint study efforts. Specifically, I am interested in the following:

- names and project assignments of all full-time, part-time, detail, and consultant personnel in both Washington and Boulder;
- -- description and status of all pending personnel actions (hires, transfers, in-or-out details, etc.) for WPSD and BPSD.
- -- status of all program activities being planned or carried out by WPSD and BPSD (whether originated by OTP, PSD, or elsewhere) including program and project descriptions, work statements and schedules, and personnel assignments and loading.
- -- description and status of all outside activities (committee participation, undesignated projects, etc.) in which PSD personnel are involved.

my white head

I would appreciate having the above information this week, if possible, so we can discuss any needed clarifications or new proposals prior to my departure next week for a two-week trip. To minimize the time and effort involved in preparing this material, I propose that Cecil Thompson from my staff coordinate closely with you or Paul Polishuk for the remainder of the week.

SIGNED S

Walter R. Hinchman

cc: Cecil Thompson Michael McCrudden

WHINCHMAN:dc

DO Chron DO Records Subj. RF.

Anterin

Mr. Whitehead Dr. Mansur

- 2 -

Coordination between OTP and PSD

Interim Procedures

November 17, 1971

The following procedures dealing with coordination between the Office of Telecommunications Policy and the Policy Support Division are intended to expedite the handling of matters requiring mutual agreement between the offices while maintaining the necessary accountability for these arrangements. The procedures will be in effect from November 22 until rescinded or modified by further agreements between the principals identified:

Liaison Responsibilities: Primary responsibility for 1. all aspects of inter-office coordination shall rest with the Manager, Policy Support Division and Walter Hinchman, Assistant Director of OTP. All actions concerning the allocation and assignment of personnel and budgetary resources among program and project areas shall be coordinated through this interface. Actions dealing solely with administrative questions (personnel actions, housing, general budget items, etc.) shall be coordinated through Michael McCrudden (OTP) and (PSD). Substantive exchanges at the program and project level will be the responsibility of the relevant OTP and PSD program managers, except that any decisions involving a personnel or budgetary change shall be coordinated with the principals noted above.

II. Documentation Procedures: All matters concerning the identification and definition of significant program activities, the allocation of personnel and budgetary resources, and the selection and assignment of specific personnel (including consultants and details into and out of the PSD) shall be coordinated via written memoranda and sign-off procedures between the appropriate action officers named above. Routine small modifications of work statements, schedules, etc. on particular projects may be handled orally or in writing at the discretion of the originator, although brief written statements are encouraged. III. <u>External Activities</u>: All plans for PSD staff participation in external activities (conferences, seminars, committees, other-agency activites etc.) and PSD seminars involving outside participants and substantial staff participation, should be coordinated with the OTP in advance of a firm <u>commitment</u>, so as to avoid unnecessary duplication, conflicting activities, and inefficient use of PSD resources. Likewise, the OTP will advise the PSD of anticipated seminars, etc. which it is organizing and invite participation by the relevant PSD personnel.

- 2 -

Connera

OFFICE OF TELECOMMUNICATIONS POLICY EXECUTIVE OFFICE OF THE PRESIDENT

DEPUTY DIRECTOR

September 8, 1971

MEMORANDUM TO THE STAFF

SUBJECT: The Policy Support Division of the Department of Commerce

The Policy Support Division of the Department of Commerce was formally established on 15 August. The Memorandum of Understanding executed between OTP and the Department of Commerce establishing the features of the organization is attached for your information. It should be noted that the Policy Support Division is separate and distinct from the Frequency Management group in Commerce, which provides direct support to OTP in frequency assignment. Both the Policy Support Division and Frequency Management group will have separate budgets and managements and will, in general, be independent of one another.

We anticipate in FY 71 the Policy Support Division will reach a staff level of 60 by year end. The composition of the staff will be similar to that of OTP, but with somewhat more emphasis on analytical and technical disciplines. Tentative plans call for the structuring of the Policy Support Division work into six program areas: (1) Administration; (2) Transmission (Long Haul) Systems; (3) Local Distribution Systems; (4) Mobile Systems; (5) New Technology; and (6) Special Programs (if needed). Each program area will have all of the professional disciplines necessary to support its functional responsibilities.

At the beginning of each fiscal year OTP and the Policy Support Division Manager will establish a budget, both fiscal and personnel, by identifying broad programs corresponding to (or traceable to) OTP programs and, subsequently, budget allocations will be made to the six functional areas. The functional areas will maintain a competence in their respective activities and develop appropriate data to support the broad programs. Special projects will be staffed with a sub-set of personnel from one or more functional areas headed by a project leader. The project leader will provide direct liaison and coordination with the OTP in the execution of project activities. The functional area leader and the manager of the Policy Support Division will be the channel for liaison with OTP in the broad on-going activities.

Walt Hinchman has been designated to represent OTP in matters concerning the broad plan and budget of the Policy Support Division, and as OTP develops requirements for support we would ask that you work through Walt to establish the necessary resources and commitments. Also, Walt will arrange for the establishment of projects to support specific studies or tasks, but once the projects are in being it is expected that OTP program managers will work directly with the project leaders. In effect, this delegates to Mr. Hinchman, in conjunction with the Manager, the responsibility for resource allocation in the Policy Support Division, but provides direct access at the project level for OTP program managers.

I believe that if we follow the guidelines stated above we will minimize the problems of coordination that may otherwise arise.

Manuer

George F. Mansur

Atch.

FRAMEWORK FOR COMMERCE POLICY SUPPORT

1. Commerce's policy support function will be performed by a separate unit within the Office of Telecommunications, to be known as the Policy Support Division. This unit shall be located in the greater Washington metropolitan area. During FY 1972 certain members of the Policy Support Division shall be located at OT/Boulder, and this arrangement will be continued as long as OT and CTP find it to be useful to the overall program.

2. Proposed programs for the Policy Support Division will be developed by its manager and OTP staff for approval by the Assistant Secretary for Science and Technology and the Director of OTP. It is understood that such programs must remain sufficiently flexible to enable redirection of emphasis as immediate, and to some extent unpredictable, needs of OTP may require.

3. Budget requests for the Policy Support Division will be agreed upon between the Assistant Secretary for Science and Technology and the Director of CTP. OTP will actively support such requests before the Office of Management and Budget, and will provide such assistance as Commerce may require in supporting such requests before Congress.

4. Selection of the Manager of the Policy Support Division and its professional personnel shall be made with the concurrence of OTP. In order to facilitate exchange of information, and thereby to enable the Policy Support Division to provide the close support required, the lines of communication between OTP and the Policy Support Division shall be direct.

UNDERSTANDINGS CONCERNING

MINIMUM BUDGET AND STAFFING ARRANGEMENTC

.Mr.

FOR

COMMERCE SUPPORT TO OTP

A. BUDGET

1. The Policy Support Division will have a budget of \$1.9 million for that portion of FY 1972 from and after August 15. Of this amount, up to \$800,000 will be contract funds, leaving a minimum of \$1.1 million for salary and expense items. It is assumed that this minimum will be expended in staffing the Division as outlined below (see "Staffing" section). If it becomes apparent, however, that staffing is not proceeding at a rate which will consume the full minimum, funds sufficient to bring the total personnel expenditure up to the minimum will be spent for the temporary detail of OT/Boulder employees to the Policy Support Division, or, if jointly agreed by OT and OTP, for the performance of Policy Support Division work by OT/Boulder.

2. It is understood that OT does not propose to devote any portion of the ITS budget allocation to continued support of all those activities listed under the column "OTP Policy Support" and the activity listed as item 3 (d) under the column "General Technical Support" on the OT Initial FY 1972 Project Plan, dated 7-29-71 and attached as Appendix A. To the extent, however, that OTP wishes such activities to continue, they will be supported from the Policy Support Division's budget allocation.

3. In order to assist OT/Boulder during the transitional year, it is agreed that at least \$250,000 of the Policy Support Division's \$800,000 FY 1972 contract funds will be expended at Boulder, either to pay for the temporary detail of OT/Boulder employees to the Policy Support Division or, if jointly agreed by OT and OTP, for the performance of Policy Support Division work by OT/Boulder. Funds expended at OT/Boulder pursuant to the last sentence of item (1) above will be credited against this \$250,000 commitment.

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

May 25, 1971

MEMORANDUM FOR THE RECORD

Subject: Meeting with Members of OT, Commerce concerning Government Communications-

On May 18, 1971 Art Cooke and I met with Messrs. Kandoian, Richardson, Lowe, and a number of OT staff members.

The purpose of the meeting was to acquaint Kandoian et al with the scope of our activities in the Government Communications area. Specific areas addressed were: Costs of Communications, Telecommunications Standardization, Management of Government Communications, and Emergency Preparedness activities including Federal-State coordination.

Art Cooke discussed our future interest in standardization but made it clear that OTP activity in this area was in a "hold condition" until the results of other studies (management) were concluded. I informed OT that Art would be a point of contact on the standardization and management in Government Communications areas when I am not available.

I made it clear that we had not yet determined what help was needed from OT in these areas, but that I would be happy to examine any of their proposals in any of the areas mentioned.

I agreed to having the meeting taped but requested a copy of the tape.

hub ye rles C. Joyce, Jr.

cc: Mr. Whitehead Dr. Mansur Mr. Hinchman Mr. Scalia

Mr. Cooke

OFFICE OF TELECOMMUNICATIONS POLICY

TO Ton	ACTION Concurrence Signature Comments For reply Information Per conversation	MUDMODOC
FROM Walt	DATE	

REMARKS

Bob Lowe bas been after me every hay for the past week or more for our reaction to the attached list of mospective penelists for the or issue study. We wants (a) deletione, (b) additions, ord(c) a ranking of these we would consider acceptable. I have indicated my thoughts where they are well formulated. If I can have yours I will respond so that we are not ited for delaying the study -- unless you think we should delay?

Walt

Called in by Bob Lowe, 5/18/71

Edward C. Jordon Department of Electrical Engineering University of Illinois

Albert Wheelon Hughes Aircraft Company Culver City, California

"James Hillier (belote - author RCA Laboratories of "Silent Cristo") Princeton, New Jersey

Ken McKay (replace by Jin AT&T Fisk, Dick Neigh, 195 Broadway or atterrative) 7 New York, New York

Dr. Emanuel Piore (lulida) IBM Armonk, New York

(5)

?

Joseph M. Pettit Stanford University Palo Alto, California

Don G. Fink IEEE ---New York, New York

Dr. John G. Linville Stanford University Palo Alto, California Louis Smellin MIT Cambridge, Massachusetts

Richard T. Gifford General Electric, Co. Lynchburg, Va.

Joseph T. DeBettencourt Raytheon Company Waltham, Massachusetts

Bernard N. Oliver Newlett Packard, Co. Palo Alto, California

-Lou Branscomb The and point - One on more DOD types as major its customers - Cullen Crane ? (RAND) - Ind mobile ada > Bioadcast interests - FAA/DOTREP. ?

(Relate - too fillicated to "Spectrum Engineering

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Wednesday 2/10/71

MEETINGS 2/18/71 9 and 10

4:30 We have scheduled a staff meeting at 9 aa.m. on Thursday (2/18) (including Kandoian and Richardson), after which there will be a discussion of organization management and issue study -- and then a review of the Commerce budget.

> cc: Dr. Mansur Mr. Urbany

Wednesday 2/10/71

MEETING

9:35 Dr. Kandoian had planned to take Friday (2/12) off -- so he can go home to New Jersey for the long weekend.

They were wondering if we could reschedule their meeting for Thursday (2/11) -- possibly 4:30.

O.K.

Stay with Friday and have only Richardson & Lowe

Have it after return from Texas next week

cc: Dr. Mansur

Wednesday 2/10/71

MEETING 2//12/71

9:10 We have rescheduled the meeting with Kandoian/Richardson/Lowe for 3:30 Friday 2/12/71 --- Mr. Hinchman will brief you and Dr. Mansur at 3 o'clock on Friday prior to that meeting.

cc: Dr. Mansur

Thursday 2/4/71

MEETING 2/10/71 3:00-5:00

- 5:00 The meeting with Dr. Kandoian, Dr. Richardson and Bob Lowe to discuss organization, management and possibly the issue study has now been scheduled for 3 o'clock on Wednesday (2/10) -= Mr. Hinchman will brief you at 2:30.
 - cc: Dr. Mansur Mr. Hinchman

Wednesday 2/3/71

MEETING

5:15 Dr. Kandoian and Mr. Whitehead have agreed to have a meeting from 3:00 to 5:00 Monday (2/8/71) to discuss organization, management, and, if possible, the issue study. Dr. Mansur wants to be out on Monday, so Mr. Whitehead would like to have this meeting rescheduled. The following people will be involved in the meeting: Tom, George, Walt, Kandoian, Richardson, and Lowe.

Mr. Hinchman will brief Dr. Mansur and Tom a half an hour before hand on organization and management. Mr. Hinchman will work with Bob Lowe to see if they can develop the issue study to a point such that it's worth discussing at this meeting.

2:30 Hunder 2/10 2:30 3-5 pm

Commerce Bobyt

EXECUTIVE OFFICE OF THE PRESIDENT OFFICE OF TELECOMMUNICATIONS POLICY WASHINGTON, D.C. 20504 MG 2/18 1971

February 15, 1971

MEMO FOR: SEE DISTRIBUTION

Subject: DOC/OF FY 72 Budget From: Francis'S. Urbany

Attached is the current draft of the DOC/OT FY 72 Budget. It will be the subject of discussion at the staff meeting on Thursday, February 18, with Messrs. Kandoian and Richardson. I have provided them with copies of the OTP FY 72 Budget.

Attachment

Distribution: Mr. Whitehead Dr. Mansur Mr. Dean Mr. Hinchman

DEPARTMENT OF COMMERCE OFFICE OF TELECOMMUNICATIONS

Budget Estimates, Fiscal Year 1972 Congressional Submission

Table of Contents

Item	Number
Organization chart	OT-1
General statement	OT-2
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Research and analysis for policy formulation	OT-14
Utilization of telecommunications technology	OT-18
Improvement of government telecommunications systems	OT-28
Summary of requirements by object class	OT-32
Justification by object class	OT-33
Executive direction and administration	OT-36



- $\frac{1}{2}$ Title assigned at present is: Asst. Director for Administration. $\frac{2}{2}$ Executive Secretariat of group known within Government as Inter-
- department Radio Advisory Committee.
- 3/ ITS is located at Boulder, Colorado.

General Statement

The mission of the Office of Telecommunications is to provide research, engineering, analysis, and technical services in the field of telecommunications. It provides these services to support the Director, Office of Telecommunications Policy (OTP), Executive Office of the President in the performance of his responsibilities for the development of telecommunications policy and management of the radio spectrum and to enable the Secretary of Commerce to carry out his statutory responsibilities for research on the transmission of radio waves. Changing telecommunications technology impacts on the public and on the government's own vast communications system. Assessments of these impacts and explorations of alternatives are essential to effective policy formulation. Research is conducted on radio propagation, radio system characteristics, utilization of the radio spectrum, compatibility of multiple spectrum uses, and in the general field of telecommunications sciences in support of the OTP and other government agencies.

Following is a comparison of the 1971 appropriation, the 1972 estimate, and related data on current employment:

	1971 to Date		(dollar a 1972	mounts in Estimate	thousands Inc. (+)	Perm.	
Appropriation	Perm. Pos.	Amount	Perm. Pos.	Amount	Perm. Pos.	Amount	emp. 12-31
Research, engineering, analysis, and							``
services	159	\$2,642	168	\$5,000	+9	+\$2,358	153

Research, Engineering, Analysis, and Technical Services

The Office of Telecommunications was established on September 20, 1970, in response to . Executive Order No. 11556 of September 4, 1970, This order prescribes the functions of

the OTP, which had been established by Reorganization Plan No. 1 of 1970. The order also assigned additional telecommunication responsibilities to the Secretary of Commerce in support of that office. On September 20, 1970, the Office received the Institute for Telecommunication Sciences as a transfer from the National Oceanic and Atmospheric Administration, together with a small management and program staff from the Office of Assistant Secretary of Commerce for Science and Technology. Subsequently, transfers were made on October 18 and on December 27 of portions of the Frequency Management Directorate from the OTP.

The President's message transmitting the Plan to Congress, together with several recent studies on telecommunications, both government and private, recommended the strengthening of the Executive Branch capability to deal with telecommunications technical problems and policy issues. Among others, studies have been made by the Commerce Technical Advisory Board, the Director of Telecommunications Management, the Joint Technical Advisory Committee of the Institute of Electrical and Electronics Engineers and of the Electronic Industries Association, the President's Task Force on Communications Policy, the Office of Management and Budget, and the Comptroller General of the United States.

The more significant needs that have been identified can be summarized as follows: domestic policy issues dealing with such systems as domestic satellites, cable television, and computer communications; coordination of Federal government communications policies for effective procurement, management, and operation of facilities and services; and management of the electromagnetic spectrum resource so as to assure the greatest value from its use.

The need to improve the Federal activities in the promotion, use, management, and regulation of telecommunications is emphasized by considering characteristics of the telecommunications resource: the communications common carriers have a plant investment approximating \$54 billion; the government's investment approaches \$45 billion; common carrier revenues (1969) totalled about \$19 billion; and the resource contributed about '6½ percent of the 1970 gross national product (amounting to over \$63 billion). The

industry continues to be characterized by rapid technological change and rapid growth. It is a key technology in conserving and developing other resources such as human time and skills, transportation, and the production of goods.

In fiscal year 1971, the Office of Telecommunications redirected its programs and research staff to start meeting its new responsibilities. This was followed by a 1971 supplemental budget request so that work could proceed in areas which could not be accommodated within existing resources, and on which it was important that work not be delayed. A supplemental for \$700,000 was enacted by the Congress, and approved by the President on January 8, 1971.

The budget for fiscal year 1972 contemplates a period of consolidation and progress in moving toward the objectives of Reorganization Plan No. 1 and Executive Order No. 11556. The appropriation request is limited to an increase of \$2,105,000 in funding to provide for full year costs in 1972 of staff and facilities transferred from other agencies in 1971, plus \$253,000 for new programs to provide (1) improved support for assignment of Federal radio frequencies, (2) expanded research on national telecommunications issues of high priority in the distribution of television and similar services by broadcast and cable, and (3) research on technology for expanded mobile telecommunications systems.

Appropriation: Research, engineering, analysis, and technical services

1

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2

<u>Summary of Requirements</u> (dollar amounts in thousands)

Page No.	Summary of adjustments to base and built-in changes	<u>.</u>						Perm. Pos.	Amount	Perm. <u>Pos</u> .	Amount
OT-7 .	Appropriation, 1971 (supplemental) Transferred from other accounts Appropriation,1971 Adjustments to base and built-in changes:	•••••				•••••	•••••			43 <u>116</u> 159	\$ 700 <u>1,942</u> 2,642
	Transfers Other increases Subtotal, adjustments to base and built-in char 1971 adjusted requirements (base for 1972)	iges	• • • • • • • • • • • • • • • • • • • •	• • • • • • • • • • •			•••••	····	+1,307 + 798	 159	<u>+2,105</u> 4,747
	Comparison of 1971 appropriation, adjustments to base, 1971 adjusted and 1972 estimate by activities:	Approp Perm.	971 priation	Adjus to Perm.	tments Base	<u>1971</u>	Adjusted	<u> 1972 E</u> Perm	stimate	Inc.(+): over 19'	Dec.(-) 7 <u>1 adj.</u>
0T-9	Services for frequency management and usage: Assignment of Federal radio frequencies Timeshare computer terminal for IRAC	<u>Pos.</u> 25	Amount \$252	Pos.	<u>Amount</u> +\$776	Pos. 25	Amount \$1,028	Pos. 25 2	Amount \$1,028 +83	Pos+2	Amount
	Prediction and compatibility analysis services. Subtotal	<u>13</u> 38	<u>229</u> 481	<u></u> 	<u>+118</u> +894	<u>13</u> 38	<u> </u>	<u>13</u> 40	<u>347</u> 1,458	+2	+83
OT- 14	Analysis of U.S. positions on inter-		. /								
	Economics of new communications services Economics of radio spectrum use	3 12 _2	46 232 <u>26</u>	· · · · · · ·	+32 +126 <u>+21</u>	3 12 2	78 358 _47	3 12 _2	78 358 47		····
0T-18	Utilization of telecommunications technology: Technological characteristics of	~ <u>1</u> 7	304	•••	+179	17	483	17	483	* *. *	* * *
	telecommunications services Extension of radio syspem performance predictions Multiple use and sharing of radio spectrum	20 • 23 6	252 733 126	• • •	+315 - 2 +62	20 23 6	567 731 188	27 23 6	737 731 188	+7	+170
	Information development and management Subtotal	<u>25</u> 74	<u>213</u> 1,324	<u></u>	<u>+214</u> +589	<u>25</u> 74	<u>427</u> 1,913	<u>25</u> 81	4.27	+7	+170

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	Improvement of government telecommunication	s syst	ems: bility						•		•
OT-28	Extension of proposed frequency assignment/ Analysis of Federal telecommunications	17	364	• • •	+183	17	547	17	547		
	expenditures	8	81		+169	Ś	250	8	250		
	Assistance to state and local governments	30	<u>88</u> 533		+91 +4/3	5	179	5	179	<u></u>	
	Increase								7/0	+9	+253
	Total requirements	159	2,642		+2,105	159	4,747	168	5,000	+9	+253

Explanation and Justification of Adjustments to Base and Built-in Changes

	Perm. Pos.	Amount
<u>Iransfers</u>		
Transfer from "Salaries and expenses, National Oceanic and Atmospheric Administration"	+8	\$+364
and Atmospheric Administration"	+80	+1,262
Administration"	• • •	+3
Standards"	+3	+61
Office of the President"	<u>+25</u> +116	$\frac{+252}{+1,942}$

These amounts were transferred to the Office of Telecommunications pursuant to the provisions of Reorganization Plan No. 1 of 1970 and Executive Order No. 11556 of September 4, 1970.

Other increases

1 *

Transfers: Additional amount needed in FY 1972 to fund positions transfer	red in FY 1971 on a
full-year basis:	
Transfer from "Salaries and expenses, National Oceanic and Atmospheric	
Administration"	+89
Transfer from "Research, development, and facilities, National Oceanic	·
and Atmospheric Administration"	+540
Transfer from "Salaries and expenses, telecommunications, Executive	
Office of the President"	+678
Subtotal, transfers	+1,307

Transfers (subtotal from preceding page)	+1,307
Cost of within-grade step increases	+14
Full-year cost in FY 1972 of FY 1971 supplemental appropriation	+700
Cost in FY 1972 of services provided by other agencies	+84
Subtotal, other increases	+2,105

A total of \$1,307 thousand is required for full-year costs of transfers. Of this amount, \$629 thousand is required for the full-year cost of positions transferred in FY 1971 from the National Oceanic and Atmospheric Administration. Full-year costs in FY 1972 of OTP operations transferred require a \$678 thousand increase, including \$107 thousand for full-year costs of personnel transferred in 1971 and \$571 thousand in other object classes provided by OTP in 1971, which will be financed by the Office of Telecommunications in 1972.

Within-grade step increases, calculated on a position-by-position basis require \$15 thousand additional in FY 1972, less \$1 thousand for turnover in positions.

Full-year costs in FY 1972 of the FY 1971 supplemental appropriation require an increase of \$700 thousand, comprising \$321 thousand in personnel costs and \$379 thousand in other object classes.

Full-year costs in FY 1972 for administrative services rendered to the Office of Telecommunications by other agencies in FY 1971 require an \$84 thousand increase.

Justification of Program and Performance

Activity: Services for frequency management and usage

	1971 A	djusted	(dollar am 1972 E	ounts in Stimate	thousands) Inc. (+) or Dec. (-)		
	Perm. Pos.	Amount	Perm. Pos.	Amount	Perm. Pos.	Amount	
Assignment of Federal radio frequencies Timeshare computer terminal	25	\$1,028	25	\$1,028	•••		
for IRAC Prediction and compatibility	••	• • •	2	83	+2	+\$83	
analysis services	<u>13</u> 38	$1,\frac{347}{375}$	$\frac{13}{40}$	$1, \frac{347}{458}$	+2	· ***	

Base Program

Provide staff support for the assignment of radio frequencies to Federal agencies -- Management of Federal radio frequencies includes three basic steps:

- Through the International Telecommunication Union and its supporting committees, international agreement is achieved on how portions of the radio spectrum are allocated to various radio services. (This is further described in the next activity.)
- 2. Within these international agreements, the Office of Telecommunications Policy (OTP), which is responsible for Federal use of the spectrum, and the Federal Communications Commission, which is responsible for non-Federal use, cooperate to equitably share the radio spectrum between (a) Federal and non-Federal users and (b) the different types of radio services. The resulting agreements form the National Table of Frequency Allocations.
- 3. Specific authorization to Federal agencies and stations for spectrum use is achieved by frequency assignments made by the Director of OTP.

The Interdepartment Radio Advisory Committee (IRAC), representing 16 government departments and agencies, advises the Director of OTP in each of these steps. The Office of Telecommunications provides the Secretariat for the IRAC and the review, analysis and liason required for frequency assignment.

During the past year, the IRAC considered a monthly average of 5,000 applications for frequency assignments, changes, and deletions. The Departments of Defense and Transportation account for more than 70% of the frequency assignments, followed by the Departments of Justice, Interior, and Agriculture. Of the 60,000 individual actions processed during the past year, more than 600 required U.S. - Canadian ccordination and all required coordination between interested Federal users of the radio spectrum. Ccordination between Federal and non-Federal users is maintained through continuous staff liaison with the FCC.

Overall planning requires participation in ad hoc committees to recommend improvements in different bands, to review Federal use of specific bands, and to plan future use. Also, personnel participate in working groups to solve particular problems such as the development of standards for marine and land radar, and the use of space techniques in aeronautical and marine mobile communication.

A computer is used for processing the applications and the output of this computer is reviewed to identify applications requiring individual or committee judgment - those applications involving special cases or controversial questions. The Office also updates the Government master file of frequency assignments, directs the computer support activity, publishes lists of assignments, and maintains the emergency readiness plan for use of the spectrum.

Predict radio system performance as affected by interfering natural and man-made phenomena and insure compatibility of proposed frequency assignments with existing assignments -- The complexity of analyzing interference which might be created or experienced by a new station or system increases steadily because of the growing use of the radio spectrum and of more radio noise producing machines and devices. The interactions involved require computer analysis of: (1) which frequencies have been assigned; (2) locations of existing systems; (3) existing equipment characteristics; (4) the propagation characteristics of different frequencies; and (5) prevailing radio noise levels and terrain at specific locations.

A major computer center of the Office of Emergency Prepardness is currently used by the Office of Telecommunications to help maintain and analyze the Government Master File of frequency assignments and files of non-government and international frequency assignments. Elementary computer programs are also available to help analyze interference as described above. With the formation of the Office of Telecommunications, resources in both Washington and Boulder, Colorado are being oriented to improve the information in the data files and the programs used for interference analysis. For example, existing computer programs will be drawn from the Institute for Telecommunication Sciences in Boulder and from other agencies such as the Electromagnetic Compatibility Analysis Center of the Department of Defense.

The improved output from the computer will provide more guidance and lead time for spectrum nanagement decisions and frequency assignments; other agencies will use the information for equipnent procurement and system planning. Standardization of the information and the development of display techniques will help provide the telecommunication community with a common, acceptable technical basis for frequency management decision.

Increase for Fiscal Year 1972

Provide staff support for the assignment of radio frequencies to Federal agencies: <u>Fimeshare computer terminal for IRAC</u> ... 2 \$83 +2 +\$83

The preceding material describes responsibilities of the Office of Telecommunications in support of Pederal frequency assignments. Currently it takes about a month (except for emergencies) to process Pederal applications for such assignments. Partially this is because of limitations of the information stored in the computer. Although, as described above, this information is being improved, the main reason for this delay is that existing procedures for using the computer rely on batch processing. Thus, there is no way for another government agency to query the computer directly to rapidly determine whether or not a particular frequency is unassigned -- they learn this by applying for the frequency.

During fiscal year 1971, the Office of Telecommunications Policy will let a contract to develop timesharing computer programs. These will permit a number of users to query the computer simultaneously. Thus, users preparing requests for frequency assignments or planning development programs will be able to find out directly and immediately whether specific frequencies of interest are available. The new programs will also reduce the redundancy and improve the organization of material stored in the computer.

The funds proposed for fiscal year 1972 are for prototype installation and initial testing of the new programs. This installation is coordinated. with the installation of terminal equipment planned by the other agencies. The programs must be thoroughly tested because about 15% of the Federal assignments records are classified; for the new time-sharing system to be effective, it must provide access to the data by other agencies but it must do this without endangering the security of classified assignments.

When operable, the systems will: (1) reduce the time needed by other agencies to determine system compatibility; (2) provide more complete and accurate information from the information improvements mentioned in the preceding subactivity; (3) reduce the number of applications which must be processed since agencies will be able to determine which frequencies are unassigned by querying the computer directly; (4) eliminate the need for other agencies to keep separate data bases of their own since their existing data will be in the master file; and (5) help achieve uniform methods of defining system requirements and assessing compatibility between systems by applying a uniform terminology and format to the data and programs drawn from other agencies .

Cost estimates, timeshare computer terminal for IRAC

Details of cost increase

11	Personnel services: 1 GS-13 systems analyst	400.000
	Estimated Cost III II 1972 (Lapsed 23.2/	\$20,000
12	Personnel benefits	1,500
21	Travel and transportation of persons	700
23	Rent, communications, and utilities: Terminal computer	47,000

Main computer, 15 hours @4006,000Timeshare computer 300 hours @154,500Common services800	11,300
Supplies and materials	200
Equipment: Magnetic tape unit for remote computer terminal 1,500 Portable computer terminal (slow speed)	<u>2,300</u>
	Main computer, 15 hours @400 6,000 Timeshare computer 300 hours @15 4,500 Common services

Activity: Research and analysis for policy formulation

	(dollar amounts in thousands)						
	1971 Adjusted		1972 Estimate		Inc. (+)	or Dec. ((-)
	Perm.		Perm.		Perm.		
	Pos.	Amount	Pos.	Amount	Pos.	Amount	
Analysis of U.S. positions on						And and the second seco	
international telecommunications	3	\$ 78	3	\$ 78			
Economics of new communications							
services	12	358	12	358			
Economics of radio spectrum use	2	47	2	47			
Total requirements	17	483	17	483			

Base Program

<u>Provide analysis for formulation of U.S. positions on international telecommunications</u> <u>matters</u> -- The radio spectrum is finite, and must be shared by all nations according to international agreements. The U.S. must participate in these agreements to meet national defense needs and to help ensure full growth of its economy.

The major organizations which develop international agreement on standards are the International Telecommunication Union and its supporting committees. Major organizations which represent users of international communication systems and services include the International Civil Aviation Organization, the World Meteorological Organization, and the Intergovernment Maritime Consultative Organization.

continuing

This program includes three areas of international activity: (1) the analysis of international telecommunication matters; (2) recommendations to the Office of Telecommunications Policy on the appropriate U.S. technical/economic position in such matters; (3) the provision of accredited technical/economic representatives to international conferences. In the process of analysis, gaps in available information are identified and programs to fill these gaps are outlined. A primary objective is to improve coordination within the U.S. among different government agencies and scientific and industrial groups on questions concerning international issues. This program helps develop international agreement on policies which better meet the overall needs of government, science, and industry; and helps us to keep abreast of international developments. It contributes to U.S. participation in world markets by providing position statements which consider overall U.S. industrial capabilities.

Determine economic implications of new communication services -- Analyses of the economic impact of new systems, such as communication satellites, are needed by the Office of Telecommunications Policy to develop programs which may be recommended by the Executive Branch in the overall public interest. These analyses must consider questions such as: What will be the impact of a new system on existing systems? How can the new and the old function together to best meet the overall needs of government and the public? In what form should the new system be encouraged to grow? The decisions made on new services have a significant impact on how the spectrum is used, on the structure of the telecommunication industry, and on the services which are provided to the government and the public. The following material gives examples of current issues which will be analyzed.

New common user services: Until now, common carriers such as the telephone and telegraph companies have been the principal means used to provide communication systems for the nation. However, the Federal Communications Commission (FCC) has approved an application from Microwave Communications, Inc. (MCI) which implies a definite change in this method. MCI applied for permission to provide a voice-grade communication link between Chicago and East St. Louis -- a route which parallels those of the common carrier. For local distribution, MCI will seek to interconnect with the common carrier. MCI proposes to charge lower rates because, it asserts, its system is less costly. The telephone companies contend that MCI's lower rates are not basically a result of a less expensive system but are possible because MCI will serve only high-density markets. They also feel that this is an improper encroachment on their markets. The issues are of fundamental importance to the common carriers and they are appealing the MCI decision in the Federal courts. Since its decision on MCI, the FCC has received about 1700 station applications from firms who wish to provide specialized services. For example, a system quite different from that proposed by MCI has been proposed by the Data Transmission Company (DATRAN). This would be a national system and independent of the common carrier network. It would be specialized in that it would transmit mainly digital information. Thus, it involves a sharing of services but not systems. The FCC has not yet rendered a decision on this application.

To develop national policies governing issues such as this, it is necessary to analyze the economic impact of inter-city communication provided by single systems and by several. specialized systems. These studies must consider the economic consequences of such systems on market development, service flexibility, and service responsiveness. Such studies will be conducted by the Office of Telecommunications and submitted to the OTP for consideration, and possibly through the OTP to the Federal Communications Commission. Until such information is available, decisions concerning the introduction of new services must be made with a doubtful assessment of their potential economic impact.

Interconnections and attachments to the public message network:

Another example is FCC's "Carterfone decision." This decision permits firms other than the common carrier to build and sell terminal equipment which can be attached to telephone lines providing such equipment does not harm existing systems or operating personnel. To protect the networks and personnel, the carriers have required that such devices be connected only through equipment supplied by them. Manufacturers and users of these devices claim that use of the carrier equipment retards innovation and marketing of new devices.

The Office of Telecommunications Policy (OTP) has requested an analysis and recommendations for procedures to meet the needs of the carriers, manufacturers and users. The Office of Telecommunications is undertaking such a study and the results will be submitted to the OTP and for the form of alternate sets of standards, and programs for achieving compliance with these standards, to govern the interconnection of customer terminal devices and systems. These standards will involve both costs and benefits to customers, suppliers, and the common carriers. The impact of each of these will vary with the approach. The economic analysis, drawing upon technical studies of equipment and systems (see third activity of this justification), will seek to define those sets of standards which provide the greatest overall benefits with an equitable distribution of costs.

Examine economic aspects of radio spectrum use -- As is indicated several times in this justification, present methods for managing frequency assignments involve complicated procedures and lead to inequities in spectrum allocation. This program will examine alternate methods of frequency management and recommend improvements to the Office of Telecommunications Policy. The analysis will evaluate various approaches to frequency sharing and coordination. Each alternative will be evaluated in terms of the incentives for its adoption, its cost, its utility, and its amenability to the regulatory process. Examples of some of the concepts involved are given in the following material.

Frequency sharing: Because of the existing methods for handling frequency assignments, some frequencies are assigned nationwide, on a block basis, although they may be used only in certain regions. These could be shared if methods were developed for regional assignment. Other frequencies experience only limited use by government and industry. These could be shared if the periods of use were clearly defined. Currently, government has almost no knowledge of actual use. Studies to measure actual use in urban areas are being undertaken by the Office of Telecommunications, as described in the third activity of this justification. The results of that work will be applied to the studies described here.
Coordination: The interference of one system upon another could be minimized if the design of the individual systems were coordinated. Some antennas, for example, radiate signals in all directions even when they are only providing point-to-point communication. In other systems, the use of more sensitive receivers would permit communication with less powerful signals.

Incentives: Previously, users have had little opportunity or incentive to share frequencies, to develop more efficient and coordinated syncoms, or even to use their own frequencies efficiently. (Existing procedures involve only a relatively small charge for commercial licenses; no charge to government agencies.) A number of methods has been proposed for providing economic incentives. These include: (1) have government sell frequencies to the (highest bidder; (2)) evaluate the relative economic value of different frequencies and charge (different rates accordingly (i.e., rates might vary with the coverage different frequencies provide); (3) define frequency cost as some multiple of the information carrying capacity (bandwidth) involved; (4) charge lower fees for systems using efficient equipment. Some of these proposals have basic inherent weaknesses which must be objectively analyzed along with their advantages. Also, in considering any economic incentive, we must be sure that special needs such as public safety and education will not be limited by purely economic criteria. This program will evaluate incentives such as these and consider their appropriateness to each alternate method of frequency management.

prilly and the

Activity: Utilization of telecommunications technology

	1971 Adjusted		(dollar amounts in th <u>1972 Estimate</u>		ousands) Inc. (+)) or Dec. (-)	
	Perm. Pos.	Amount	Perm. Pos.	Amount	Perm. Pos.	Amount	
Technological characteri- stics of telecommuni- cations services:							
Communication networks Broadcast, cable, and	6	\$181	6	\$181	•••	•••	
related services	5	68	9	168	+4	+\$100	
Mobile communications New technologies and	l	82	4	152	+3	+70	
services Subtotal	8 20	<u>236</u> 567	8 27	<u>236</u> 737	+7	+170	
Extension of radio sys- tem performance pre-							
dictions	23	731	23	731	•••		
of radio spectrum	6	188	6	188			
management	25	427	<u>25</u> 81	427	• • • • + 7	÷ • • •	
	a she	the state of the s	0.4	2,000	+ /	7110	

Base Program

Identify new technological characteristics of telephone, television, and mobile radio transmission that allow more intensive resource use -- There is a continuous effort to send more information faster and with greater convenience. Currently, there are particular growth pressures in the areas of telephone, television, and mobile radio communication. Individual use of the telephone is increasing -- both local and long distance; telephone systems are being used to provide new services such as video phone and computer linkage. Cable systems such as cable TV are proposed to provide higher information rates and more specialized services including newspaper and mail by facsimile, a wide variety of entertainment and educational programs for specialized audiences, and improved medical diagnosis and care . New demands for OT-18 radio communications have created serious congestion in frequency bands used for mobile communications and affect areas such as law enforcement, aeronautical communications, Federal and industrial services.

Policy recommendations to meet these pressures for expansion must consider the technical characteristics and costs of existing systems and compare these with the opportunities and costs of new advances in technology. Also, minimum standards must be defined to permit the greatest flexibility in the development of consumer attachments and system interconnection. Such comparisons and standards require technical analysis in areas such as local and long distance transmission, routing systems, local exchange systems, cables and guided waves, communications theory and communications equipment such as antennas, modulators, demodulators, and encoders.

The "Carterfone decision," mentioned under the preceding activity illustrates one need for minimum technical standards. This decision permits firms other than the common carrier to build and sell terminal equipment which can be attached to telephone lines. To support possible policy recommendations in this area, the Office of Telecommunications is undertaking a study to determine which standards might be established to (1) assure that the equipment built by different firms will not disrupt the operation of the telephone lines; (2) assure that this equipment will not harm operating personnel; (3) permit maximum innovation for new services.

The Office has begun to evaluate the methods, costs and benefits of using cable distribution to its fullest potential; also, to determine which and how many of the services proposed for cable systems can actually be provided by a single cable. This analysis will be broadened to include other techniques such as very high and ultra high frequency broadcasts and combinations of cables and microwave links. Alternate methods for providing mobile communication services (land, sea, and air) for large segments of the public will be identified and evaluated. These include conventional AM and FM radio, guided-wave transmission, and microwave/millimeter wave and satellite systems, together with appropriate signal processing technologies and terminal devices.

Extend the ability to predict radio system performance as affected by natural phenomena -- The ability to predict the performance of radio communications systems, and thus analyze the compatibility of different services, requires a basic understanding of how the energy that is transmitted is modified by the electrical and physical properties of the medium -- the atmosphere, the terrain, the earth's crust, or outer space. This knowledge is developed through experimental, analytical and theoretical studies. The results are used to more efficiently use the radio spectrum, to extend its use, and to assist government agencies to meet their system requirements.

coexisting

Specific procedures were developed during fiscal year 1971 to ensure that the information resulting from these studies is placed in the master computer used for frequency assignment, as described in the first activity of this justification .

In system design, the results of this work help government engineers design the most effective system for the job. The data and computer programs are used, for example, to specify the minimum power levels required and the likelihood of system outages, or to develop new types of systems, to open up the millimeter and optical regions to practical communications systems.

A few examples of systems currently limited by lack of this type of knowledge are given below.

At frequencies below fifty million cycles per second (50 megahertz) new and more precise understanding of how the atmosphere and earth affect certain frequencies is needed by the Department of Transportation for marine and aeronautical navigation and for aircraft collision-avoidance systems, and is needed by the Coast Guard to pinpoint the location of oceanographic drilling in the ocean shelves; mine safety and rescue communications require understanding of how these frequencies travel through layers of earth and rocks. In the region from fifty million cycles per second to 10 billion cycles per second (10 gigahertz) we must increase our understanding of meteorological effects on signals to avoid significant outages in some satellite communication links and in regional radar systems used by the Federal Aviation Agency for air traffic control, and to avoid interference between satellite and terrestrial systems which share frequencies. The region of the spectrum above 10 billion cycles per second through the upper limits of the visible spectrum is a band 100.000 times larger than the entire spectrum below 10 billion cycles per second. Thus, this upper frequency region has the potential for handling tremendous amounts of information. Unfortunately. the atmosphere interacts strongly with these higher frequencies and thus limits their use. Yet, it would be valuable to gain the use of even a small fraction of this part of the spectrum by improving our understanding of atmospheric effects.

Ongoing programs in these areas have been reoriented to meet the needs of the new Office. During fiscal year 1971, a model was developed to predict the effects of irregular terrain on propagation through the lower atmosphere. Existing models for very high and ultra high frequency propagation were united in a model for the time-share computer program. Other work included measurements of terrain effects upon microwave signals, the effects of the

atmosphere on microwave and millimeter-wave signals, and refinement of propagation theory.

During fiscal year 1972, below 10 billion cycles per second, we will continue measurements and analyses to understand better such basic effects as how attentuation varies as a function of frequency in particular bands and the correlation of quantities such as amplitude, phase and velocity at different frequencies. These measurements and analyses will provide technical information about the limitations imposed by the medium upon the rate and accuracy with which information can be sent. From this, better models for predicting system performance can be developed and tested. Above 10 billion cycles per second, the work on the degradation of millimeter wave signals by the atmosphere will be continued, as a part of the long-term objective to develop a basis for quantitative calculation of propagation effects on the reliability and bandwidth of communication systems operating in the millimeter, submillimeter, and optical regions.

Develop means for more efficient use of the spectrum resource through multiple use and sharing -This activity evaluates and compares the costs and technical characteristics of existing and proposed methods of communication -- particularly which areas of the spectrum are used by each and how much of the spectrum each requires. Similarly, it considers existing and proposed techniques for sharing the spectrum and for compatible use of the same frequencies simultaneously by different techniques. Appropriate government-supported studies are analyzed and evaluated. These include research developed in government, university and industrial laboratories. The studies are then integrated to define the existing state-of-the-art. From this base, we can determine what gaps exist and what new research, if any, is required.

An example of a current need is that of frequency sharing between satellite and terrestrial communication systems. For economy, stations for both satellite and terrestrial links often need to be located close together -- near large cities, for example. However, it is sometimes necessary to place the satellite receiver at a remote location so that it won't pick up signals from the terrestrial system. Such a remote location can add millions of dollars to system costs. An example of a study to help solve this problem is work now in progress in the Office of Telecommunications.

During fiscal year 1971, the phenomena most likely to cause such interference were experimentally verified -- scattering of signals by rainfall and deflection guiding of signals by the atmosphere. Statistical models were developed to predict this interference and measurements of existing systems were made for statistical analysis. During fiscal year 1972, the models will be tested against the actual observations. The final models will be

used in frequency allocation and system design. This information is needed to help develop international agreements concerning satellite system operation. It will also contribute to trade-offs on cables versus satellites. In these analyses, emphasis will be placed on those methods which offer potential for expanding the use of the higher frequencies (millimeter, submillimeter and optical). As described in the preceding subactivity, these frequencies offer the potential for communicating great amounts of information rapidly. Pressure to make use of them is being generated particularly by the growing need for industry and government to link computers and use them at high speeds. Examples of sharing possibilities to be considered are satellite and <u>relay</u>, satellite and mobile, and mobile and commercial broadcast.

Develop, maintain, and disseminate technical and economic information for analysis of telecommunications issues -- To conduct the analyses and technical studies described in this justification, the Office of Telecommunications is developing a central data source to provide the necessary technical, economic and census data. This will include data on the use (past, present, and potential) of specific communication services; data on the cost, price and revenues of systems used to provide these services; the density and distribution of population; business statistics and trade data; data on past, current and impending technological developments and on the current scientific understanding which underlies these developments. No adequate collection of such information exists today.

The data will be used for analyses and for systems evaluation by the Office of Telecommunications, the Office of Telecommunications Policy, the Federal Communications Commission, other government agencies and industrial engineers. The information base will be built by acquiring a minimum of general information plus the special information needed to support particular analysis projects. This information will be updated by research and analysis results as completed. The center will be linked to other information centers to a central source of communications data; provide for the organization, storage and retrieval of data; and provide for the dissemination of data through remote-access computer terminals, publications, short courses, and personal consultation.

During fiscal year 1971, initial work is being done to determine the sources of census, economic and technical data; to specify the methods and models to be used; to determine the information needed for specific current projects and to begin collection of this information. Q During fiscal year 1972, the collection of data will be increased. Major gaps in existing information will be identified and procedures established for eliminating these gaps and for systematically updating information. By the end of the year, a useful initial base should be established and computer requirements defined.

Increases for Fiscal Year 1972

9

\$168

+4

Identify new technological characteristics of telecommunications (broadcast, cable distribution, and related services)

As mentioned in the first section of this activity, an objective of this program is to define the possibilities and limitations of broadcast, cable, and related systems for possible policy recommendations concerning the most effective use of overall resources. During fiscal year 1971, work was started to identify and evaluate the technical potentials, and costs and benefits of expanding broadband cable services beyond the conventional cable television service. During fiscal year 1972, the base funding will be used to continue and broaden this work to include broadcasting techniques and cable/microwave combinations. The additional funding requested for fiscal year 1972 is to develop the detailed design of a pilot project to test the technical practicality, public acceptance, economic value and economic impact of some of the services proposed for cable systems.

\$68

5

Once a broadband system (such as cable TV) exists, the cost of adding additional channels is very small compared to the cost of the original system or of a new broadcast station, and these systems offer the potential of providing twenty or more channels with consistent quality and clarity. This would permit low cost transmission of specialized programs appealing to all types of minority groups. There is also the possibility of establishing two-way or "talk-back" communication for educational and training programs. Thus, cable systems could be used not only for entertainment, but also for special purpose programs by educational institutions; city, state, and Federal agencies; and community groups.

Despite the interest in cable systems, no one knows how many of the proposed services can be provided in the same cable without mutual interference. This must be known to evaluate system potential. Related to such technical questions are economic questions. For example: How will these special programs and services be prepared and funded? This question is already being faced by the owners of cable systems, since, after April 1, 1971, systems having over 3,500 subscribers will be required by the Federal Communications Commission to provide original programming to a "significant extent." There is a major question of economic impact: What will be the impact of expanded cable TV systems upon the broadcast networks? This is of concern to both the Office of Telecommunications Policy and the Federal Communications Commission. The potential of offering new services via cable systems, is, therefore, of basic interest to local and Federal government, to the many owners of cable systems, and to the broadcast

DT-23

+\$100

networks. Yet, while there is much speculation of the potential in this area, there is little information on which to base Federal policy recommendations for cable development.

The additional funds requested during fiscal year 1972 are to develop: (1) detailed engineering plans for testing the compatibility of different services in operating systems; (2) specific procedures for evaluating the technical, legal, social, and economic impact of pilot programs; (3) specific procedures for guiding government, educational and community groups in the development of effective, low cost programs, material and services (as library services) for delivery on cable systems; and (4) specific recommendations for one or more pilot programs. These will include recommended site or sites, cost estimates, time scales, and recommendations for financial participation by cable operators and other interested parties. These plans will be developed in cooperation with city administration, cable operators, and other Federal agencies interested in urban communication systems (such as the Department of Housing and Urban Development; Health, Education and Welfare; Labor; and Transportation). In 1971, the National Academy of Engineering is expected to complete a study of urban communications for the Department of Housing and Urban Development. This study and its recommendations will be considered in the program development.

Federal funds are requested for this program for two reasons: (1) the cable industry consists of over 2,000 independent cable operators. Almost all of these are much too small to take the financial risks of such experimentation and most do not have the technical expertise to design and carry out the experimental programs; (2) it is important to the Nation that the system which evolves be designed to meet overall needs rather than the special needs of any particular group.

Cost estimates: Broadcast, cable distribution, and related services

11 Personal services:

12

1 GS-13 Physical scientist	`.
l GS- 5 Clerk-typist	
Estimated cost in FY 1972 (lapsed 25%)	\$36,000
Personnel benefits	2,800
	OT-24

21	Travel and transportation of persons	\$4,000
22 23 24	Transportation of things Rent, communications and utilities Printing and reproduction	1,000 6,000 2,000
25	Other services: NBS cross servicing	\$44,700
26	Supplies and materials	620
31	Equipment	2,800
Identif	y new technological	
Commun	ications (mobile	
teleco	mmunications system) 1 \$82 4 \$152 +3	+\$ 70

During fiscal year 1971, programs are underway to identify the areas which offer the greatest immediate potential for improving mobile communications. Based on the results of this work, base funding during fiscal year 1972 will be used to do the following work pertinent to land mobile systems:

- Measure actual use of the radio spectrum by mobile systems at frequencies around 150 and 450 MHz. (These two frequency regions are not now used efficiently although techniques for more efficient use exist. We need to know how to apply these techniques effectively.)
- Measure how use of the spectrum varies with geographic location. (To thus consider how techniques such as the cellular concepts described below and others might best be applied.)

 Measure the actual interference experienced by different signals at different locations. (This is the basic factor determining system performance in a crowded environment.)

. .

4. Review current methods and identify needed improvements for predicting probability of service for land mobile and for VHF/UHF ship-to-shore and shore-to-ship operations. This will specifically include analysis of the Great Lakes area which is planning to use these frequencies in the near future.

The increased funding for fiscal year 1972 is requested to analyze and evaluate new methods which offer potential for mobile communication. These include AM single sideband and FM multi-channel transmissions; guided wave systems for one-way communication to vehicles on highways; satellite systems; and multi-channel, random-access systems which could permit users of the same band to use all frequencies simultaneously through techniques for time-sharing or special coding.

Part of the fiscal year 1972 funding will be used to measure actual interference experienced by different signals in urban areas at 950 MHz a region which probably will soon be allocated for mobile use. These measurements will help in the assignment of mobile frequencies in this region. They will also be compared with the measurements made at the lower frequencies to test the concept of predicting use in one frequency band from measurements of use in another band. Techniques which may provide greater service without using more spectrum will be analyzed and evaluated. These include multiple use of the same frequency and cellular concepts for private messages which would restrict the use of individual mobile stations to small areas but connect these areas with fixed radio or cable relays. The cellular concept, for example, has both its advocates and opponents --- the characteristics of this technique must be clearly defined and compared before the potential value of the technique can be determined.

Another promising technique is the use, at base stations, of directional antennas which can be rapidly switched to direct signals to different points. Terminal equipment which will be evaluated include teletype terminals and antennas which provide more limited and uniform coverage. An estimate will be made of the extent to which spectrum use might be reduced by offering one-way paging systems for some mobile services currently handled only by two-way communication. These programs will also apply to the development of other services such as vehicle location devices, desired, for example, to keep track of taxi cabs and police cars.

Each alternative will be evaluated in terms of (1) at which frequencies is it most efficient • and (2) how much bandwidth does it require. The output of the programs will be reports to OT-26 serve as a partial basis for frequency allocations and system design requirements to be established by the Office of Telecommunications Policy and the Federal Communications Commission, and also to aid the designers of mobile systems.

Cost estimates: Mobile telecommunications systems

Il Personal services:

	GS-14 Electronic engineer \$19,643 GS-13 Electronic engineer 16,760 GS-12 Operation research specialist 14,192 Annual rate 50,595 Estimated cost in FY 1972 (lapsed 25%)	\$38,000
12 21 22 23 24 25	Personnel benefits Travel and transportation of persons Transportation of things Rent, communications, utilities Printing and reproduction Other services:	3,000 1,200 1,000 2,300 900
	NBS cross servicing 1,600 Common services: Reimbursable project to measure actual interference versus minimum acceptable interference (wanted to unwanted signal ratios) in urban areas at 950 MHz <u>18,500</u>	
26 27	Subtotal Supplies and materials Equipment Total requirements	20,100 1,400 2,100 70,000

Activity: Improvement of government telecommunications system

		(dollar	amount	s in thousa	ands)		
1971 A	djusted		1972 E	stimate	Inc. (+) or Dec. (_)
Perm.			Perm.		Perm.		
Pos.	Amount		Pos.	Amount	Pos.	Amount	
17	\$547		17	\$547	• • •		
8	250		8	250			
<u>5</u> 30	<u>179</u> 976		<u>5</u> 30	179 976	• • •	• • •	
	<u>1971</u> Perm. Pos. 17 8 <u>5</u> 30	<u>1971 Adjusted</u> <u>Perm.</u> <u>Pos. Amount</u> 17 \$547 8 250 <u>5 179</u> 30 976	(dollar <u>1971 Adjusted</u> <u>Perm.</u> <u>Pos. Amount</u> 17 \$547 8 250 <u>5 179</u> <u>30 976</u>	1971 Adjusted (dollar amount 1971 Adjusted 1972 E Perm. Perm. Pos. Amount 17 \$547 17 \$547 8 250 5 179 30 976	$(dollar amounts in thousand 1971 Adjusted 1972 Estimate Perm. Pos. Amount Pos. Amount 1072 Estimate Perm. Pos. Amount 107 $547 17 $547 17 $547 8 250 8 250 \frac{5}{30} \frac{179}{976} \frac{5}{30} \frac{179}{976}$	$(dollar amounts in thousands)$ $\underbrace{1971 \ Adjusted}_{Perm.} \underbrace{1972 \ Estimate}_{Perm.} \underbrace{Inc. (+)}_{Perm.} \underbrace{Pos. \ Amount}_{Pos. \ Amount} \underbrace{Pos. \ Amount}_{S547 \ Constraint} \underbrace{Pos. \ Amount}_{S547 \ Const$	$(dollar amounts in thousands)$ $\underbrace{1971 Adjusted} Perm. \\ \underline{Pos. Amount} \\ 17 \\ \$547 \\ 8 \\ 250 \\ \frac{5}{30} \\ \frac{179}{976} \\ \frac{5}{30} \\ \frac{179}{976} \\ \frac{1972 Estimate}{Perm.} \\ \underline{Porm.} \\ \underline{Porm.} \\ \underline{Pos. Amount} \\ \underline{Pos. Amount}$

Base Program

Extend the ability to insure compatibility of proposed frequency assignments with existing assignments -- This justification has given several examples of work being done to estimate and minimize interference between systems, or between a system and the existing environment. In some of these examples, it was stated that an eventual output of the project was to improve the computer models used for frequency assignment. The work described here provides a central effort to collect such technical input from the Office of Telecommunications and other sources, and provide it in a suitable form to support the first activity of this justification. It is a broad program, covering many of the specific technical areas previously mentioned. As described, there is a need to improve the technical data used by the Office of Telecommunications Policy to control and manage Federal use of the radio spectrum. This includes technical information on how the spectrum is used, how signals are distorted in transmission, and on the characteristics of telecommunication equipment. Economic, systematic, and rapid procedures are needed for determining the effects of these factors. "For example, in many cases, systems are designed to provide the required service at minimum cost to the owner without regard to the system's effects on other users of the spectrum. Needed are rapid economic and comprehensive analysis programs for examination of alternatives.

Under this subactivity, existing programs for path loss, prediction, and estimation of natural noise levels will be modified for use in spectrum management. Data on transmitters, receivers, and antennas will be drawn from resources within and without the Office of Telecommunications and put into the required computer format. Demographic census data will be drawn from the OT-28

information work described in the third activity. To improve the services for electromagnetic compatibility, analysis, and measurement, techniques will be developed using communication theory and data on spectrum occupancy, channel characteristics, electromagnetic transmission, and systems technology. Priorities for the development of capabilities and services will be determined by the Office of Telecommunications Policy.

In recent years, the means available to those responsible for control and management of the radio spectrum have been improved by addition of limited electronic data processing equipment for maintaining records of frequency assignment and the 5,000 changes made monthly. This is not adequate to assure that large and expensive telecommunication systems will not fail to operate because the actual environment differs from that for which they were designed, or that they will not degrade performance of other systems. Required are data on (1) spectrum occupancy by wanted and unwanted signals, (2) the distortion and attenuation of signals introduced by the transmission channels, (3) equipment performance characteristics such as spurious responses and emissions from transmitter, and (4) information on antenna efficiency and radiation patterns. Economic systematic, and rapid procedures are needed for determining the effects of these factors. In many cases, the systems are designed to provide the required service at minimum cost to the owner without regard to the system's effects on other users of the spectrum. Needed are rapid, economic and comprehensive analysis programs for examination of alternatives.

Analysis and measurement techniques will be developed for electromagnetic compatibility analysis using communication theory and data on spectrum occupancy, antenna performance, channel characteristics, electromagnetic transmission, and systems technology. Priorities for the development of capabilities and services will be determined by the Office of Telecommunications Policy.

Analyze opportunities for more effective Federal government telecommunications expenditures ---The technology exists today to greatly improve the effectiveness and versatility of telecommunications for both , but we are only beginning to understand how to apply it effectively. This problem was defined in a report of the National Academy of Engineering of August 1969:

> (Meier) has noted ... that the marginal cost per physical unit of many of our basic resources -- such as base metals, energy, water, chemicals, transportation, and labor -- have a long-term upward trend. However, the trend in the costs of telecommunications as measured per channel-mile, for example, is downward. Substitution (of one resource for another) will occur if two conditions are met:

First, information as to how to make the substitution must be available; and second, the cost of the substitution must be less than the cost of the substituted resource.

The program described under this subactivity will apply current telecommunications technology to significant Federal problems of management and communication. During fiscal year 1972, the following programs will be done:

1. Teleprocessing systems: Analyze in depth one or more areas in which several agencies are involved in the collection, processing, dissemination, and use of specific types of information (e.g., weather data); identify the existing data processing and transmission methods used, and determine the options for improving the efficiency and effectiveness of the process; determine what changes in system structure, standards, operations, and management arrangements would be needed to achieve feasible improvements.

2. Research and development planning: Develop and apply, on a pilot basis, a methodology for reviewing research and development sponsored by the Federal government in the telecommunications area to identify duplication within Federal government programs, and between Federal government programs and programs supported by other governmental levels and by private industry.

3. Budgeting for common user telecommunications networks: Develop alternative means of allocating costs to users of common user communications networks serving the Federal government, and of reflecting such costs in the budgetary process. Analyze these options in terms of technical feasibility, cost of implementation, the incentives associated with use of the network, and the capability provided for appropriate tradeoffs between telecommunications costs and other resource costs.

4. Model telecommunications system: Develop and apply on pilot basis, a model telecommunications system incorporating advanced telecommunications techniques. Provide the ability to transmit voice, video, facsimile, and computer information. Define costs of development and use, and evaluate impact on personnel efficiency. Develop recommended standards of practice for such systems and for the interconnection.

Provide technical and institutional assistance to state and local governments -- Within the limits of its resources, the Office of Telecommunications assists state and local governments through coordination and guidance, depending on the request. The services include assistance to do the following: (1) Develop effective regulatory and management activities, such as

satisfactory management structures, criteria for leasing and buying services, and common standards for procurement; (2) develop more economical and effective telecommunications systems; (3) make local systems compatible with and complementary to the national system; (4) provide information on telecommunications activities underway nationwide in government and in industry; and (5) provide coordination and technical assistance to state and local officials who seek or manage multi-Federal-agency assistance programs in telecommunications.

Studies conducted by the states within the program offered by the Office of Telecommunications have defined areas where substantial savings can be made. For example, program personnel assisted the State of Illinois in conducting a state-wide study of telecommunications which resulted in Illinois initiating the following two major steps: (1) the development of central management, maintenance, accounting and procurement procedures for its telecommunications systems; and (2) the restructuring of state communication systems to increase shared use of facilities among state agencies. State officials estimate that when completed these moves will improve telecommunication capability while reducing annual costs by more than 25% -- from \$11 million to about \$8 million. Potential reductions in annual costs of similar percentages have been identified in Alabama, Idaho, Mississippi, Nebraska, New Jersey, New York, Pennsylvania, and South Carolina.

During the past year, the Office of Telecommunications assisted the State of Alaska in conjunction with the sale of the Alaskan Communications System by the U.S. Air Force to RCA Alascom. The Office: (1) made recommendations for updating Alaska's telecommunications legislative statute, (2) investigated some of the state's service needs and suggested how these might best be met, and (3) provided technical analysis assistance in support of Alaska Public Utilities Commission hearings on the matter of RCA Alascom certification. A second phase of this study will provide a more detailed analysis of the state's needs and of systems for meeting these effectively. All data, results, and analysis from this study will be provided to Alaskan State officials so that they can make better decisions with regard to cost, reliability, and service alternatives in improving and expanding the state's telecommunications system.

Summary of Requirements by Object Class (dollar amounts in thousands)

Appropriation: Research, engineering, analysis, and technical services

		1971 Adjusted			1972 Estimate			Inc. (+) or Dec. (-)			Emp.
Object	Class .	Pos.	Av.No.	Amount	Pos.	Av.No.	Amount	Pos.	Av.No.	Amount	12-31
11	Personnel compensation:										
TT • T	tions	159	154	\$2 504	168	161	\$2 594	+9	+7	+\$90	166
11.3	Positions other	100	101	<i>vz</i> , <i>svi</i>	100	101	42,001	12		1.4.5.5	
	than permanent	17	2	29	19	2	32	+2		+3	6
11.5	Other personnel						2			. 7	
	Total	176	156	2,535	187	163	2,629	+11	+7	+94	172
Oth	er objects:										
12	Personnel			204			211			÷7	
21	Travel and		•	204			011				
	of persons			100			106			+6	
22 .	Transportation										
	of things			36			38			+2	
23	Rent, communi-										
	utilities			. 385			441			+56	
24	Printing and										
0.5	reproduction .			159			162			+3	
25	Supplies and			971			1,047			+/0	
	materials			164			166			+2	
31	Equipment			193			200			+7	
e .	Total requirem	ients		4,747			5,000			+253	

Justification by Object Class (dollar amounts in thousands)

		1971 .	Adjusted	Ê	1972	2 Estimate		Inc.	(+) or Dec	. (-)	Emp.
<u>Object</u>	class	Pos. A	v.No.	Amount	Pos.	Av.No.	Amount	Pos.	Av.No.	Amount	12-31
11.1	Permanent posi- tions	159	154	\$2,504	168	161	\$2,594	+9	+7	+\$90	166
9 new p tions a	oositions accounting are lapsed at a 25%	for 7 a rate, wh	ddition; ereas ex	al man yea kisting po	rs are sition	e requeste ns are lap	d for FY sed at 5%	1972. •	The addit	ional po	si-
11.3	Positions other than permanent	17	2	29	19	2	32	+2		+3	6
The \$3, in fiel	000 increase is for d operations.	additio	nal man-	-hours of	tempoi	ary,part-	time, and	inter	cmittent em	ployment	
11.5	Other personnel compensation	•••	• • •	2	• • •		3	•••	•••	+1	
The \$1, workloa	000 increase is for ds.	overtim	e pay of	f clerical	emplo	oyees to p	rovide pr	ompt s	service to	meet pea	k
12	Personnel benefits Contributions to civil service	:									
	retirement fund			175		000	181			+6	
	FICA taxes Group life in-		•••	2			2	•••	•••	•••	
	surance Group health	•••	• • •	8	• • •		9	•••	•••	+1	
	benefits Other: employees	• • •	•••	17	• • •	•••	17	• • •,	•••	•••	
	awards etc. Total,personnel	 benefits		$\frac{2}{204}$		• • •	211	0 . 0	000	+7	

The increase is to cover the Government contribution to the civil service employee retirement fund, social security, insurance, and health plans prescribed by law, for the 9 additional positions requested for FY 1972.

21	Travel and trans-			
	portation of per-			
	sons:			
	Domestic travel	80	86	+6
	Foreign travel	18	18	
	Local transportation Total, travel and trans-	2	2	
	portation of persons	100	106	+6

The \$6,000 increase is for operation and managerial duty transportation and per diem costs, in support of proposed expanded programs.

22	Transportation	of things:	36	38	+2
----	----------------	------------	----	----	----

The increase results from the necessity to transport household goods of employees changing their permanent duty station from Boulder, Colorado to Washington, D.C.

23 Rents, communications,			
and utilities:			
Rental of electronic			
computing equipment	263	310	+47
Rental of commercial			
space	70	70	
Rental of equipment	12	16	+4
Communications and			
utilities	40	45	+5
Total, rent, communi-			
cations, and utilities	385	.441	+56

The \$56,000 increase is primarily for additional rented computer services in support of the Interdepartment Radio Advisory Committee, plus additional office equipment rental and communications costs.

24 Printing and reproduction: 159	162	r	+3
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This increase is for additional reproduction of studies and reports for research, analysis, and technical services.

25	Other services:			
	Services of other Fed- eral agencies	858	894	+36
	services Total.other services	<u>113</u> 971	<u>153</u> 1,047	<u>+40</u> +76

This increase consists of contractual services to be performed in connection with proposed expanded programs, supplementing in-house research and analysis.

26 Supplies and materials:	164		166		+2			
The \$2,000 increase will provide toner plus the purchase of scie	additional offi ntific and techr	.ce supplies, nical publicat	including tions.	copying machine	paper	and		

		100	200	+7
21	Faul nment.	193	200	T/
J 1		130		

The \$7,000 increase is for purchase of equipment required to support proposed expanded programs.

Executive direction and administration

Costs of executive direction and administration are distributed to all Office of Telecommunications projects as an overhead charge. The estimates for the research, engineering, analysis and technical services appropriation presented earlier in this justification include applied bureau overhead.

The following tables summarize the entire Office of Telecommunications executive direction and administration costs by location and object class.

Summary o:	f	Requirem	ien	ts	by	Locati	on
(dollar	r	amounts	in	tł	nous	sands)	

	1971	Adjusted		19	72 Estim	Inc. (+) or Dec. (
	Perm. Pos.	Av. No.	Amt.	Perm. Pos.	Av. No.	Amt.	Pos.	Nos. Amt.
Bureau Headquarters, Washington, D. C.	12	12	277	12	12	\$268		°°° -\$9
Institute for Tele- communication Sciences, Boulder, Colorado	9	9	223	9	9	224		··· <u>+ 1</u>
Total requirements	21	21	500	21	21	492		8

Summary of Requirements by Object Class (dollar amounts in thousands)

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Object Class P	os.	1971 Adjus Av. No.	<u>ted</u> Amt.	Pos.	1972 Estim Av. No.	Amt.	Pos.	Av. No.	Dec.(-) Amt.	Emp.12/3
ll Personnel com- pensation 1.1 Permanent										
Positions 1.3 Positions other than perma-	21	21	\$353	21	21	\$356	•••	•••	+\$3	16
nent 1.5 Other person- nel compen-	•••	•••	• • •	•••	•••	• • •	•••	•••	• • •	•••
sation	21	÷••• 21	2 355	21	21	2 358	••••	••••	+3	16
Other Objects:										
<pre>12 Personnel benefits 21 Travel and transportation</pre>			28			28				
of persons 22 Transportation			35			35	· ·		• • •	
of things 23 Rent, communi- cations, and			2			2			•••	
utilities 24 Printing and			30			30			•••	
reproduction 25 Other services 26 Supplies and			10 16			10 16				
materials 31 Equipment Total requirements			13 <u>11</u> 500			13 492			-11 -8	

Justification by Object Class (dollar amounts in thousands)

1 . 1

Obje	ect class	1971	Est Av.	imate	19	71 Es	timate	Inc.	(+) c	pr Dec.(-	.)
		Pos.	No.	Amount	Pos	. No	. Amount	Pos.	Av. No.	Amount	Emp.
11.]	Permanent positions	21	21	\$353	21	. 2	1 \$356			+\$3	16
The	increase is for within-grade	step	incre	eases.							
12	Personnel benefits Contribution to civil servi	ce					1				ø
	retirement fund			25			25				
	Group health insurance			1			1				
	Other: incentive awards			1			1				
	accident compensation, etc			7							:
	Total, personnel benefits			28			1 28				
0.7							20				
22	Travel and transportation of	pers	ons	35			35				
23	Rent communications			2			2				
	Space rental	litie	S	0.2							
	Communications and utilitie			21			21				
	Total, rent, communications	and									
	utilities			30			30				
24	Printing and reproduction			10			10	,		• • •	
25	Other services			16			16			• • •	
20	Supplies and materials			13			13				
There	e are no increases required f	or ob	ject	classes	12.21.	22.	23 24	25 and	26		
31	Equipment			11	,,	,	,,	20 unu	20.		
										-11	

The decrease in this object class reflects the one-time nature of office furniture and equipment purchases fiscal year 1971 following establishment of the Office of Telecommunications on September 20, 1970.

Commence

Honorable Melvin R. Laird Executive Agent National Communications System Office of the Secretary of Defense Washington, D.C. 20301

Dear Mr. Secretary:

By my letter of March 5 to Mr. deRosa I forwarded a copy of the revised "Statement of White House Requirements for Presidential Communications with the General Public During Periods of National Emergency," and advised him of my intention to initiate a review of the entire Emergency Broadcast System (EBS).

A group of technically qualified personnel is required as a nucleus to conduct this review. The people assigned to this group, augmented as required from other agencies and industry, will work within the attached terms of reference to recommend measures to improve the operation of the existing EBS, and to provide options for improvement which can be made in the next one to three years.

I would appreciate your requesting the Manager, National Communications System, to provide two persons as participants in this nucleus group.

I am certain that you share my concern with past failures of the EBS, and I am sure that with the cooperation of all interested parties steps can be taken to insure a more responsive system in the very near future.

Sincerely,

/signed/ Clay T. Whitehead

Attachment

cc: General George A. Lincoln, OEP Commissioner Robert G. Wells, FCC Governor John E. Davis, OCD Dr. Robert M. White, NCAA Li. General Richard P. Klocko, DCA Mr. Louis A. deRosa, DoD Mr. Whitehead (2)

CTBabcock/bss/3-23/71

TERMS OF REFERENCE FOR REVIEW OF THE EMERGENCY BROADCAST SYSTEM

A group of technically qualified personnel will be formed to conduct a review of the Emergency Broadcast System (EBS). This group will be headed by a member of the staff of OTP, and will be made up of two members provided by NCS and one person provided by the FCC. The group will be augmented as required by persons from the communications industry and other Federal agencies.

The EBS Review Group will accomplish the following:

a. Determine what caused the inadvertent activation of the EBS on rebruary 20, not as a "finger pointing" exercise but to insure that the group has complete knowledge of the incident. The Department of Defense investigation and the FCC investigation will be made available to assist in this effort.

b. Recommend measures required to correct any deficiencies in the existing EBS. Include incorporation of new and revised requirements as stated in the "Statement of White House Requirements for Presidential Communications with the General Public During Periods of National Emergency" dated February 26, 1971, and the additional requirements forwarded to OTP by General Hughes in his memorandum for Clay T. Whitehead, dated March 4, 1971.

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c. When the recommendations to correct deficiencies are approved, rewrite the EBS plan to reflect required changes.

d. Provide options for near-term improvement of the EBS

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in order to increase its reliability, responsiveness, coverage, etc.

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Comment

monorable Robert G. Wells Defense Commissioner Federal Communications Commission Washington, D.C. 20554

Dear Commissioner Wells:

By my letter of March 5 I provided you with a copy of the revised "Statement of White House Requirements for Presidential Communications with the General Public During Periods of National Emergency," and indicated my intention to study the problems associated with the Emergency Broadcast System (EBS).

I have determined that a small group of technically qualified people, separate from the interagency warning review group, is needed to conduct a complete review of the EBS. This group, augmented as required from other agencies and industry, will work within the attached terms of reference to recommend measures to improve the operation of the existing EBS, and to provide options for improvement which can be made in the next one to three years. I anticipate that long range changes to the EBS may be influenced by the findings of the warning review group.

Because of the FCC's experience in the establishment and operation of the existing EBS, I would appreciate your providing one person as a participant in the EBS review group. I anticipate the EBS review will be completed in a relatively short time frame, and am hopeful that it will result in a system that is completely responsive to all requirements.

Sincerely,

/signed/

Clay T. Whitehead

Attachment

cc: Honorable Melvin R. Laird, NCS General George A. Lincoln. OEP Governor John E. Davis. GCD Dr. Robert M. White, NOAA Lt. General Richard P. Klocko, DCA Mr. Louis A. deRosa, DoD /Mr. Whitehead (2)

CTBabcock/bss/3-23-71

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U.S. DEPARTMENT OF COMWERCE Office of Telecommunications Washington, D.C. 20230

March 17, 1971

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

Dear Dr. Whitehead:

Your letter of March 5 to Secretary Stans, commending the consistently superior performance of Mr. Chester R. Kirkevold, as well as the remainder of the IRAC Secretariat, has been brought to my attention.

We are, of course, very pleased to acquire such a competent group to continue the important work in support of effective radio frequency management. Staff of the IRAC Secretariat maintained close supervision at all stages of the move of its equipment and records on Saturday, March 6. On the following Monday, this staff resumed its tasks in its new guarters with no apparent disruption in workflow.

A copy of your letter is being forwarded to the Director of Personnel, Department of Commerce, for inclusion in Mr. Kirkevold's official personnel file. Also enclosed for your information is a copy of a memorandum which is being circulated to the remainder of the IRAC Secretariat.

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Sincerely yours,

Annig & Kaudocan

Armig G. Kandoian

Enclosure



U.S. DEPARTMENT OF COMMERCE Office of Telecommunications Washington, D.C. 20230

March 17, 1971

MEMORANDUM

All Staff of the IRAC Secretariat

Armig G. Kandoian

To:

From:

By letter of March 5, the Director of Telecommunications Policy conveyed through Secretary Stans his wish for "good luck" to Mr. Kirkevold and all the Secretariat personnel as they leave OTP to join our Office of Telecommunications staff. In doing so, he commented as follows:

"Since becoming Director of Telecommunications Policy, I have had the opportunity to observe regularly the outstanding work of Mr. Kirkevold, as well as the remainder of the IRAC Secretariat. They have coped in an outstanding manner with a heavy daily workload, critical to effective radio frequency management. I feel that the Department is fortunate to be taking aboard these fine personnel and have no doubt that you will find their work to be of an exceptionally high calibre."

I am, of course, very pleased to acquire such a competent group to continue the important work in support of effective radio frequency management. Further, I have noted that IRAC Secretariat staff maintained close supervision at all stages of the move of its equipment and records on Saturday, March 6, so that it could resume work on the following Monday, with no apparent disruption in workflow. This tells me a good deal regarding the competence and dedication of the staff.

-> CC: Dr. Whitehead

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

Date: February 22, 1971

Subject: OT Organization and Operation

To: Tom Whitehead George Mansur

> Last week's discussion of Commerce organization and operations highlighted several problems which I feel are jeopardizing the effectiveness and stature of the Office, such as:

- Too much emphasis on <u>form</u> and <u>appearance</u>, rather than substance;
- Too little appreciation of the methods required to <u>achieve</u> (rather than simply <u>state</u>) desired objectives when dealing with the Federal bureaucracy;
- Too little in-depth discussion and analysis of complex issues, resulting in too many hasty, ill-conceived decisions based on naive assumptions.

I believe these factors are at the root of several past or pending problems such as uncoordinated and conflicting staff assignments, personnel actions, interagency miscues, and a general inability to get a cohesive effort underway on current issues. The Commerce situation is a typical and timely example of these problems.

There is little point in providing a lengthy rehash of the complex nature of the Commerce organizational problem, given the current reluctance to read or attempt to digest such tomes, and the disposition toward precipitate action without comprehension. Let me just make the following assertions based on previous experience both with Commerce specifically and the Federal bureaucracy generally:

- 1. The ITS "management" problem is not confined to the Director alone, though he represents a significant part thereof; it is more of a cancerous infection with tentacles running throughout the organization.
- 2. To "cure" this cancer requires a rather delicate blend of skillful surgery, careful feeding of the non-cancerous individuals, and the creation of a stimulating environment for interdisciplinary types of analyses.
- 3. The greatest immediate need, and most promising opportunity, is to establish a new and challenging institutional setting for <u>selected individuals</u> from the ITS staff, with am environment of interdisciplinary teamwork rather than tightly structured research projects.
- 4. Imposition of a "hard hat" manager on the existing ITS structure will not produce the required result. It will not separate the wheat from the chaff; it will <u>at best</u> simply destroy the crop, and may at worst contaminate the entire OTP/OT operation.
- 5. "Program management" of the type described at last week's meeting also will not work in the Federal bureaucracy for the type of product we need; particularly in the case of ITS, where it has been tried many times under strong program leadership and varying line-management structures -- always without success. This can be a very effective management technique when dealing with subcontractors for specific component products of an integrated system, with relatively long development times and tight fiscal control. It is useless when dealing with quasi-independent civil servants (particularly engineer/scientists) organized in a line-management structure wherein fiscal control is largely independent of program control.
- 6. When I use the term "program management," it has a very different meaning, namely, the placement of both fiscal and managerial control in the hands of one individual (program manager), but only for the duration of that particular program

and with the flexibility to "contract" with individuals in other programs or staff positions for specific tasks to be accomplished under his supervision. This results in the creation of an interdisciplinary "team" for each particular program, and will work with scientists/engineers (and others) in the Federal bureaucratic structure.

- 7. Many of the difficulties to be faced in the analysis area for the near term will result from the motivation and lack of competence of the <u>Washington</u> staff of OT, rather than the ITS staff. Thus, it seems imperative that in structuring an analytic capability we should look for the most rapid means of replacing Washington program/project leadership with Boulder (or completely new) leadership. This <u>cannot</u> be achieved easily or rapidly through continuation of present ITS structure, no matter how "hard hat" the manager. I believe it can be achieved through the steps outlined below.
- 8. Finally, the selection of individuals for leadership roles in the Commerce operation will be productive <u>only if</u> careful attention is given to both their qualifications and the particular job assignment. An individual could be a very good candidate for program management of the type described in bulk and specialized services, yet be a disaster if placed in the broadband distribution area; the same is true both between spectrum management and other areas, and among the many facets of "spectrum management" itself.

 \underline{My} recommendation regarding the steps to take to create an effective analytic support capability for the OTP in Commerce, based on my knowledge of both the system and the individuals, is as follows:

 Establish an Analysis Division in OT consisting of perhaps 40 or more members from Boulder and perhaps 10 or more from Washington, with no institutional delineation because of separate locations; and locate a very competent, broadly interdisciplinary leader for the Division who is willing to travel almost bi-weekly to Boulder.

- 2. Allocate virtually all the \$4M in OTP support funds to this division, to be spent either internally, with the remainder of ITS or other agencies, or with private contractors as appropriate.
- 3. Remove R. C. Kirby as Director of the remainder of ITS (but do not allow him to be associated in any way with the Analysis Division), and install W. F. Utlaut as Acting Director; with the clear understanding that the conclusions of the issue study will probably result in major changes in the organization (e.g. dropping of other-agency work, transfer back to NOAA, abolishment, etc.) which would likely have an impact on his job.
- 4. Recruit <u>several</u> (e.g. 4-6) program managers <u>of the type I</u> <u>have described</u>, to work <u>within</u> the Analysis Division in pulling together teams consisting of both Boulder and Washington staff (as appropriate) to work on particular programs with <u>no</u> intermediate supervision other than purely administrative (time-keeping, office assignment, etc.).

A graphical display of this structure is shown in the accompanying figure. I am convinced this will work -- at least better than any other alternatives suggested to date -- and that it can be implemented almost immediately and begin to produce useful results within 1-2 months.

Walt Walter R. Hinchman

Encl.



Proposed Organization of the Office of Telecommunications

Amarice

March 10, 1971

Dr. Robert M. White Administrator National Oceanic and Atmospheric Administration U.S. Department of Commerce Rockville, Maryland 20852

Dear Bob:

I am forwarding for your information the revised "Statement of White House Requirements for Presidential Communications with the General Public During Periods of National Emergency" dated February 26, 1971. It is the responsibility of this Office to develop, with the cooperation of appropriate departments and agencies, the full potential of the Emergency Broadcast System (EBS) and to assure its reliable performance.

I intend to initiate a thorough review of the entire EBS program with the aim of satisfying the requirements of the President and of Federal departments and agencies. Because of your prior involvement in the use of EBS facilities for distribution of natural disaster warning, I consider your advice and assistance essential in this important undertaking.

The purpose of this letter is merely to advise you of the planned EBS review. I shall have a more specific request at a later date.

Sincerely,

/signed/

Clay T. Whitehead

Attachment

cc: Mr. Whitehead (2)

Reading File Subject File -- EBS

CTBabcock/clt/5170/3-10-71
Presidential Communications with the General Public During Periods of National Emergency

STATEMENT OF WHITE HOUSE REQUIREMENTS

Basic Requirement:

During periods of national emergency, reliable communications are required to enable the President to reassure and give direction to the populace regarding survival and recovery of the nation.

Assumptions:

a. The nongovernment communications industry will, in view of their expressed and demonstrated willingness to assist the Federal Government in the establishment of an Emergency Broadcast System. unreservedly make their for ilities available for emergency use, and provide personnel to assist in the formulation of emergency communications plans. The industry can also be expected to bear a portion of the cost of any special arrangements required, particularly in those instances in which such arrangements may find gainful application in the normal commercial enterprises of the industry.

b. Existing facilities of the nongovernment communications industry will, if utilized to the maximum advantage, prove adequate for emergency Presidential use. Because of the substantial number of facilities available, by-pass and backup arrangements can be provided in such depth as to assure a high probability of survival despite the infliction of severe damage to the system as a whole.

^{*} The Emergency Broadcast System is considered to comprise all nongovernment communications facilities designated and authorized by the FCC to operate during periods of national emergency for the purpose of meeting the basic requirement.

Guiding Principles:

a. In view of the fact appreciable costs would accrue to the Federal Government for the construction of special radio and television stations designed for use on nongovernment frequencies, and because of problems inherent in the operation of such stations and the limited day-to-day application of such facilities, it is desirable that existing privately owned facilities be utilized by the President in communicating with the populace.

b. Emergency communications facilities provided for the President's use in communicating with the populace must be configured and arranged in such a manner so as to provide a capability under the most severe circumstances.

Operational Requirements:

a. The President requires a capability to address the nation both orally (AM/FM radio/TV audio) and visually (TV) on short notice regardless of his whereabouts To this end, the following specific operational features must be provided:

(1) <u>Radio and Television Audio</u> - From a "cold" start, automatic or "seize-key" availability is desirable. It is recognized, however, that the technical arrangements inherent in the provision of such a capability are prohibitively expensive. Current commercial radio and television network procedures suggest that an availability within five (5) minutes following notification is a realistic capability. Accordingly, these procedures are acceptable for the present, however, improved procedures should be exploited where possible.

(2) Live Television Video and Sound - A reaction time of three (3) hours following notification is acceptable for the provision of a live television transmitting capability. Necessary technical arrangements and constraints listed in paragraph 2. of the Guiding Principles dictate that the President will proceed to, and speak from, locations where adequate commercial video transmitting facilities already exist. No expenditures by the nongovernment communications industry for special equipment or facilities to support this requirement, other than special arrangements referred to in paragraph a. of the Assumptions are requested or required.

b. All Presidential broadcasts during periods of national emergency will be "live". Such prerecordings as may be required to provide continuity of program service for the Emergency Broadcast System will be prepared as directed by the Department of Defense.

c. Once constituted, the Emergency Broadcast System must remain available as a network until its participating facilities are specifically released by Presidential authority and directed to shift to some other mode of operation. The White House, however, interposes no objection to the planned emergency utilization by other departments and agencies of facilities designated for Presidential use provided:

(1) The facilities have been activated by Presidential direction.

(2) The President is not actually speaking to the nation over the facilities.

In all such instances, however, Presidential priority must be preserved by a "seize-key" control feature which would enable the system to revert to Presidential use.

d. The White House encourages day-to-day use of emergency facilities for such purposes as may be authorized, provided that such use (1) provides realistic training in emergency operating modes, (2) contributes to or enhances the development of desired optimum emergency systems, (3) will not delay the establishment of the Emergency Broadcast System in the event of an actual emergency, and (4) provides at all times for the exercise of Presidential priority as set forth in the preceding paragraph.

Reliability/Survivability:

a. Communications facilities through which the President will communicate with the populace under emergency conditions will be configured and arranged in such a manner so as to provide

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a high degree of assurance that a portion of the total system capability, sufficient for the satisfaction of the basic requirement, would be available to the President under the most adverse conditions.

b. During emergencies short of an attack on the United States, adequate intercity private line communications circuits should be available to support the basic requirement. However, during an attack or heavy destruction resulting from an attack, sufficient circuit facilities may not be available in some areas to support this basic requirement as well as other critical Presidential, command and control, and intelligence circuits pertaining to the attack. In such cases, the established priority of restoration of circuits will be changed only at the direction of the President.

FE : Temmoie - Foris

comments nated,

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OFFICE OF TELECOMMUNICATIONS POLICY ROUTE SLIP ACTION Concurrence FRON Signature TO_ Comments that For reply Information Per conversation Discuss with me W. Deon DATE 3/25/41 FROM ____ REMARKS attached reflects prog resa thing Cann bestern) Coar skhort area C.C. G.F. Maisur W. Hinchman

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

Commission

Date: March 16, 1971

Subject: OTP/OT Staff Meeting

To: For the Record

Another in a series of meetings was held this date in Room 742, 1800 G Street, to enhance the joint OTP/OT effort in frequency management.

Those in attendance were:

Name	Organization	Telephone
Leo A. Buss	OTP	395-4637
Stanley Cohn	OT	967-3591
Anthony Corrado	OT	967-5012
D. D. Crombie	OT/ITS	303-447-3816
W. Dean, Jr., Convener	OTP	395-5623
William Gamble	OT	967-5012
George Garber	OT	967-5012
Lyman G. Hailey	OTP	395-5623
Bruce Higgins	OT	967-5012
Donald Jansky	OTP	395-4637
C. R. Kirkevold	OT	967-4931
Harvey Lance	OT	967-3603
Robert Powell	OT	967-3908
George V. Stelzenmuller	OT	967-3591

The discussion followed the agenda, which was distributed as Attachment 5 to the Minutes of the meeting of February 17, 1971, with frequent reference to the Minutes to check on progress.

1. Electromagnetic Compatibility

a) Analysis Capability

Mr. Higgins reported on his recent trip to Boulder with Mr. Gamble, the week of March 7th, during which discussions were held with ITS staff members as to how to proceed with the programs laid on at higher levels. Mr. Crombie felt the exchange of ideas had been most helpful.

The Convener identified four items to consider in developing an analysis capability:

- 1) an understanding of what interference is;
- 2) the probability of interference happening;
- the validity of the requirement for quality of service; and
- 4) EMC measures.

He noted that some problems can be handled by an analyist, some by a computer, and some by a combination of the two.

Mr. Cohn was asked to consider the foregoing and document his views thereon for the next meeting.

It was noted that VERSAR will brief the FMAC at its meeting on March 18, and Messrs. Cohn and Crombie were invited to attend.

b) Data Base

Mr. Crombie stated that he had not yet had an opportunity to develop a rationale as to where and how data should be obtained.

c) Automatic Data Processing

Mr. Hailey reported that, in response to a work statement, HRB Singer had submitted a bid for continuation of the maintenance program that was much more expensive than expected. As a result, he said certain items had been eliminated and discussions were being held looking toward transfer of the senior programmer (Max Rentschler) from State College to Washington, thus reducing his overhead considerably. Mr. Rentschler appears to be willing to relocate to Washington. This might facilitate easing him into the OT organization at a later date.

With respect to contracts, Mr. Garber reported that the Time Sharing contract would be advertised this week and that the HRB Singer contract would be signed on March 18. Mr. Garber also reported that a meeting had been held on February 18, 1971, between OT and NRAC personnel, for the purpose of getting acquainted, and that a general agreement had been reached on what the relationships would be.

Mr. Powell said OT is considering the hiring of a second programmer to work with Mr. Rentschler.

The Convener confirmed that OT will not be required to assume the computer operational costs until July 1, 1971.

d) Monitoring

The Convener reported on his recent visit to Boulder on March 1-2, when he had discussed this item with Mr. Barghausen and outlined four monitoring goals as follows:

- 1) Capability to verify frequency usage;
- 2) Ability to evaluate adherence to standards and procedures;
- 3) Means to investigate EMC problems at the scene; and
- 4) Capability to check the validity of EMC.

He said the OTP was not looking for a monitoring station in every locality, but one good unit in a mobile configuration, with a competent team, to move into any area where the need develops. See <u>Attachment 1</u> for a more detailed report of the visit to Boulder.

Mr. Jansky reported on the status of a related contract with SRI. SRI has been studying alternatives for mounting a monitoring capability. Because of an apparent misunderstanding of, or inattention to, the problem, the contractor has committed all his funds (\$102,000) without completing the contract. However, OTP has paid only about half of the fee thus far and may withhold the rest until satisfaction is received.

Draft reports will be available within a week with copies going to Messrs. Higgins and Crombie at once. Messrs. Higgins and Barghausen are key figures in this effort. The Convener reported that the Department of Transportation had funded a noise capability program in FY 1971 to the extent of \$500,000, through its Urban Mass Transportation Administration (UMTA). This had provided \$350,000 for channel characterization and \$150,000 for noise measurement. A letter from Mr. Gamble to Mr. Dean on this subject is contained in <u>Attachment 2.</u> Mr. Crombie said an UMTA representative had been invited to Boulder to brief members of ITS on what had been done. He expressed the hope that it might be possible to use UMTA's noise measurement capability.

2. Status of Action Items

a) Propagation

Mr. Crombie reported that Mr. Rosage has had trouble working with the HF propagation model on the OEP computer because of problems with the computer. The goal is to get the same answers, using the HF model on either the Boulder or Washington computer. Until this goal is achieved, the Boulder computer will be relied on for the solving of HF propagation problems. Mr. Crombie said he is still working on a list of Boulder models that might be incorporated in the OEP computer. Conversely, he felt a list of requirements should be developed to match up with the list of models.

Mr. Higgins cautioned that the Boulder computer will have to be used for many things until the OEP computer is available on a time sharing basis.

The Convener said the OTP had sent a letter to Commerce, Defense, and NASA in June 1970, asking the extent to which propagation research is being performed, noting the need for coordination of such effort to avoid duplication. The inquiry and replies, including a list of DOD work summaries, see Attachment 3, confirm the need for coordination.

Mr. Crombie was of the opinion most such data could be readily obtained from the files of the Library of Congress and he felt there were funds in the OT Budget to permit effort along these lines.

The Convener noted that Mr. Stelzenmuller had done much work in the field and hoped that he would be permitted to continue. He emphasized the need to develop a coordination procedure so as to avoid duplication in propagation research.

b) Specific Problems

1) CATV vs Air/Ground

The Convener reported that there was nothing more to be done at this time noting that the FAA views, supported by the military departments, had been transmitted to the FCC (see <u>Attachment 4</u>). The FCC is expected to promulgate a Notice of Inquiry to obtain the views of industry in this matter.

2) VHF follow-on aircraft study for FAA

Mr. Buss reported that he had met with Messrs. Roberts (OT/ITS) and Frisbie (FAA) shortly after the last OT/OTP Meeting to discuss the statement of the task. Mr. Crombie reported that Mr. Hatfield is using this work statement as a guide and has had discussions with the FAA regional office in Denver.

This item was ranked right after the tropospheric scatter versus space problem as to priority.

3) Altimeters vs collision avoidance systems in the band 1535-1660 MHz

The Convener reported that the scheduled tests by McDonnell Douglas had slipped from mid-March to April 5, and, in response to a comment by Mr. Higgins, asked that all contacts with the DOD be through OTP.

Mr. Crombie reiterated his desire that someone from his staff monitor the tests at McDonnell Douglas.

4) G. E. Computer Program re Orbital Satellites

Mr. Crombie reported that one of his staff is working almost full time on this model. Mr. Jansky noted that G.E. is making certain modifications and suggested that the program be kept in the EMC area.

5) Tropospheric Scatter vs Space Systems in Same Band

The Convener termed this the prime concern because many of the U.S. Proposals to the Space WARC are involved.

Mr. Jansky reported that SPS Working Group C was established to review the CCIR documents, which include a number on Tropo vs Space. He said several agencies, including HEW and NASA, have let contracts to investigate various aspects of the problem, one of which is to determine the cost effectiveness of tropo vs space. The Convener felt it important that the problem be carefully defined, and the U.S. Proposals understood, so that all would be working from the same base and with the same goal. He said an early determination must be made as to whether the U.S. Proposals between 800 and 4000 MHz are valid. In this respect he asked Mr. Crombie to meet with him at the conclusion of this meeting to develop a set of questions pertinent to the problem, such as:

- Can tropo and space systems share the same band?

- If so, what, if any, limitations need be applied?
- Are the limitations acceptable?

He noted that DOD is identifying the locations of tropo systems in the U.S., and that, lacking such data on overseas systems, the worst case will have to be assumed. He asked Mr. Crombie if he would work with the HEW contractor (Rand) at Boulder on the sharing problem. Messrs. Crombie and Jansky were identified as the prime movers on this problem.

Mr. Crombie reported on work already done, e.g., the development of curves for stationary and random orbits, and emphasized the need of information (location, frequency, power, etc.) on tropo systems both here and abroad. It was noted the latter might be obtained from the various CINC's.

6) Compatibility of Proposed New Space Systems

This is a new problem, as reflected in <u>Attachment 5</u>, introduced by Mr. Jansky, and added to the agenda for further study. It was given third priority - following Specific Problems 5 and 2.

7) Compatibility of Satellite Systems for Mobile Services in the Band 1535-1660 MHz

Mr. Cromble reported that little had been done on this problem so far and Mr. Buss indicated there was no urgency, but that this would require attention after the Space WARC. See Attachment 6.

8) Use of New Techniques to Improve the Use of the Band 2700-2900 MHz

Mr. Buss termed this another problem with little urgency and one that might be rewritten. See <u>Attachment 7</u>.

9) Compatibility of Systems in the 7/8 GHz Bands

The problem as introduced by Mr. Buss and described in Attachment $\underline{8}$ has had little attention thus far.

10) Problem Definition (see Attachment 9)

Mr. Buss described this as an attempt to outline the necessary ingredients in the definition of a problem. Mr. Higgins suggested the possibility of standardizing on the Specific Details of the Problem and the Convener termed the paper a point of departure which could be refined as time goes on. He invited anyone with suggestions for improvement to table such at the next meeting.

c) Standards

Mr. Stelzenmuller distributed copies of a paper entitled "First Priority Standards Items" (see <u>Attachment 10</u>). He felt it was desirable to have a long range standards plan but that, meanwhile, progress must be made on certain urgent items.

Mr. Jansky felt there should be some form of standards across the spectrum and Mr. Stelzenmuller noted that frequency tolerances are presently so applied and that Chapter 5 of the Manual contains other standards.

Mr. Crombip voiced the need for:

- a description of the more important areas;

- identification of those requiring urgent attention; and

- an indication of where the greatest returns might be.

Mr. Lance emphasized the need of measurement techniques to support standards. In this respect, Mr. Higgins noted the last paragraph in the paper pertains and suggested immediate attention be given to it. He observed that the Army is responsible for measurements under DOD, and suggested that Mr. Crombie and ECAC staff members get together as soon as the military coordination of the Radar Spectrum Engineering Criteria is completed. In light of their experience, he felt the military might lead the way.

The Convener agreed that no action should be taken until the coordination is completed. Then, he felt, it might be worthwhile to prepare a letter to the DOD, noting Army has been charged with measurements and asking if they might assist us in this area.

Also with respect to page 2 of Mr. Stelzenmuller's paper and the other two aspects of spectrum engineering criteria requiring attention, it was agreed that Mr. Crombie would be responsible for initiating action with respect to paragraph 1, a review to determine what technical effort is needed to correct deficiencies, and Mr. Cohn for paragraph 2, a determination of the parameters relating to radio receiver influence on spectrum usage.

Further, Messrs. Crombie and Stelzenmuller were asked to work jointly on paragraph 3a "The specifications of conditions for measuring the unwanted emissions, with necessary definitions."

.d) Interface between Frequency Management and EMC

Mr. Kirkevold reported that Mr. Roberts of OT/ITS had spent a week to ten days in Washington, after the last meeting, talking with key members of the frequency management staff to acquaint himself with the function, as a prerequisite to further effort in Boulder.

e) Interface between EMC Needs and Current OTP Data Base

Mr. Higgins reported that Volume 1 of the Sachs/Freeman Report had been discussed at a meeting of OTP/OT personnel on February 18 and again in Boulder the week of March 7. Also discussed at Boulder was the matter of terrain and different ways of treating it.

He referred to the proposal for putting two more space systems in the 7-8 GHz area and the need for better means of evaluating compatibility. He suggested the possibility of limiting microwave in this band in the future and of conducting a review of diversity systems. He said he would draft a paper outlining the problems in this area for an in-depth study by OT/ITS.

The Convener suggested the possible prohibition of fly-swatter antennas in the future.

3. Allocations

This item was deleted from the agenda with the understanding that it is a subject more policy oriented than frequency assignment, and one that should be kept constantly in mind.

4. Noise

The Convener said that he and Mr. Cohn would be attending a joint meeting of JTAC and ANSI in New York on March 24, dealing with noise. The two groups will be asked to support the OTP in this area. It was decided that neither Mr. Spaulding nor Mr. Barghausen, who had been indicated in the previous Minutes as possible attendees, would attend. Mr. Gamble said he would prepare a draft outline of what should be done in this area. This could be critiqued by JTAC and ANSI.

The Convener suggested certain questions to be considered such as:

- Is there a problem?
- How serious is it?
- What measures should be taken to reduce it?
- To what level?

He voiced the opinion that, sometime in the future, after noise has been described and means devised to measure it, legislation might be indicated as a requirement.

5. Receivers

The Convener noted that this had been treated to some extent under Standards and that the FCC will report to the FMAC, at its next meeting, on the status of its work in this area.

6. Relocation

As the move to 1325 G Street was accomplished on March 6, this item was removed from future agendas.

7. Sachs/Freeman Work Statement

It was noted that all have agreed to the need for and the text of the work statement. What remains to be done is to find a means to support the study.

It was agreed to change the title of this agenda item to Equipment Characteristics -- Sachs/Freeman Work Statement.

8. New equipments being designed which may affect radio spectrum use

It was agreed to delete this from future agendas with the understanding this is not solely a Government matter.

9. Other Business

The Convener requested that EMC Education be added to the next agenda with Newburn Smith and Spectrum Management Symposium as sub-items.

Mr. Cohn reported that he was in the process of developing a paper on dimensioning the spectrum which would be related to the possible charging for the use of the spectrum.

The next meeting was scheduled for April 14, at 9:30 a.m., at 1325 G Street, with the agenda as reflected in Attachment ??.

The meeting was adjourned at 2:15 p.m.

W. Dean,

Director Frequency Management

Mar Street

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

Attachment 1

Date: March 4, 1971

Subject: Visit to ITS, Boulder

To: Distribution List

On March 1 and 2, 1971, the undersigned visited the Boulder Laboratories of the Institute of Telecommunications Sciences, Department of Commerce. The following activities, took place:

a. <u>EMC Seminars</u> -- Two one hour seminars were presented on electromagnetic compatibility (EMC) to approximately 150 staff members of the Institute.

The first seminar covered the definition of EMC, what is being done about it, what needs to be done, what it means to obvious, and the basic needs of EMC (analysis, enforcement, equipment processing, guidance to developers and users, education, test and evaluation).

The second seminar was an in-depth presentation or problems currantly under review by ITC in support of OTP, together, with a presentation of other problems in being --- ATC communication congestion, spectrum trade offs available in the development and deployment of satellite systems using the geostationary orbit, impact of pulse compression and frequency agility techniques on efficient use of the spectrum, compatibility of proposed systems at 1535-1660 MHz (collision avoidance, instrument landing, maritime and aeronautical communications satellites, and radio altimeters), the extent of compatibility among systems in being or projected at 7/8 GHz (ESS, DOD communication satellites, meteorological satellites and terrestrial microwaves), the need to quickly determine the compatibility of proposed foreign space systems, and the compatibility of space systems and troposcatter systems occupying the same band.

Reports received from the Boulder senior staff indicated that the seminars were well received and that the visit did much to inject enthusiasm into those elements of the staff personnel who are anxious to get into "real world" problems. <u>Noise</u> -- Met with Drr Hull and Crombie on the Department of Transportation's Cambridge Laboratory, noise/measurement capabilities. It was agreed that ITS would investigate this matter with a view to melding the effort into the DOC support for OTP.

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c. <u>RIPP</u> -- Met with Dr. Hull and Messrs. Rice and Wells of ITS on the status of the Radio Interference Propagation Program (RIPP). The rain scatter model resulting from the RIPP program was adopted at the February CCIR Study Group Meetings, supporting data from the program were also introduced into the February discussions and the model was confirmed; the result being a procedure which provides for additional coordination under anticipated rainfall conditions. It was agreed that additional efforts were required to substantiate the data/information already presented, that a data summary of accumulated data through 31 January should be readied for introduction into CCIR and ITU channels by 1 April and that, as a longer range objective, the scanned beam portion of the experiment will still be required to treat the spatial distribution problem, i.e., water centent vs. area and height.

d. <u>EMC Problems</u> -- Met with Dr. Crombie and his staff on the specific tasks on which CTP would like to receive ITS help. It was agreed that extensive support could be rendered to FAA in a study of their air traffic control saturation problem; that the problem of space operations vs. trops would be given first priority in readiness for the WARC; that the matter of pulse compression and frequency agility in the spectrum could be treated, but at a lower priority; that the problems of impact of foreign systems and congestion at 1535-1660 MHz would be reviewed to determine what support might be rendered. With respect to 7/8 GHz problem, it was agreed that more information would be provided in order that the ITS personnel could become familiar with the programs and nature of the problem.

e. <u>University Curriculum</u> -- Discussion took place with Dr. Newburn Smith, Professor of Electrical Engineering at University of Michigan and former Director of ITS, Boulder, as to what measures could be taken to get student engineers familiar with the serious problem of EMC prior to completing their engineering curricula. It was agreed that source material would be forwarded to Dr. Smith, who will also get with Dr. Meile, head of the Electrical Engineering Department at University of Colorado, with a view to taking positive measures in this regard. The possibilities of guest locturers or terms of specialists to visit the top engineering schools were also touched on.

f. <u>Monitoring</u> -- Met with Mr. Barghausen of ITS and outlined the in-depth monitoring support needs of OTP -- verification of irequency usage, evaluation of adherence to standards/ procedures, EMC problem investigation, and validation of EMC analysis capabilities.

g. <u>General</u> -- A session was held with Mr. Richard Kirby, Director of ITS, and the Deputy Director, Dr. William Utlaut, on such matters as the results of CCIR Study Group sessions in Geneva and foreseen program studies for CCIR Study Group I (spectrum utilization/monitoring). The undersigned advised the senior personnel at ITS of the need for investigation into such basic matters as -- evaluation of the validity of requirements for stated qualities of service (99,99%, degrees of acceptable degradation, and values of service). It was also noted that the matter of probability, as regards time, frequency and location, were not adequately taken into account in interference/electromagnetic compatibility analysis. "The ITS interests agreed and will look into these areas further.

h. <u>ITU/University of Colorado</u> -- On March 1, 1971, the undersigned was unexpectedly invited to speak at a menting of senior ITS personnel and selected members of the University of Colorado faculty. Dr. Kandoian was also in attendance. I outlined in summary format the areas in which OTP is currently active or soon will be -- wideband distribution, interconnection, international communications, international conferences, land mobile, Government communications, spectrum management, policy and planning, and state of the radio art. The talk was well received and generated several questions of interest.

CONCLUSION

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The visit under report was very useful in that it provided an opportunity to indicate that the OTP/OT/ITS consortium is a team effort, that real problems exist, and that the help of ITS can be very contributory in the treatment of these difficulties. Mr. Stan Cohn, now a consultant with OT, also participated in the trip and found it useful from the standpoint of his getting familiar with his new responsibilities. Additional visits of this type are planned as the situation dictates.

Dean, Jr:

Distribution List:

- C. ". Whitehead
- G. F. Mansur
- L. R. Raish
- L. G. Hailey
- L. A. Buss
- D. M Jansky
- W. R. Hinchman

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Attachment 2

February 22, 1971

DOT Noise/Measurement Program

Mr. W. Dean, Jr.

On February 19, 1971, the undersigned contacted Mr. Lesley Klein of the DOT, Cambridge, Mass. research facility (formerly NASA's ERC) regarding their activities in the man-made noise area (phone 617-494-2578).

Mr. Klein explained that their efforts in the noise area were part of a larger program directed primarily toward the Non-Government land mobile radio bands (30.56-49.6 MHz, 150.8-162 MHz, 450-470 MHz and portions of the 806-947 MHz band). This program funded with \$500,000 from the Urban Mass Transportation Administration, was an FY-71 effort with no funds programed for FY-72. The program consists of two parts as follows:

A. Channel Characterization - to make field measurements to determine <u>urban</u> propagation characteristics in the above bands, to develop math models of these channel characteristics, and to construct a simulator which would enable the evaluation of land mobile equipment; and

B. Noise Measurement - to determine what parameters should be measured (\$30K to Raytheon, Research Division, Raphael Esposita), to define analysis, procedures and techniques for the utilization of the data (\$10K to Dr. Middleton - draft report completed) and to purchase equipment (\$115K to Signatron, Dr. Bellow).

This program includes procuring and equipping a mobile van for the above tasks. Mr. Klein indicated that part of the equipment has been delivered and contracts have already been let for other parts of it. He also noted that there is a need for FY-72 funds to operate this equipment and to complete the program since DOT has not funded it in FY-72.

The undersigned feels that some useful information may be obtained from the reports of Middleton and Esposita in the noise area and intends to utilize it as an input to the OT effort as well as to inform ITS of the effort. (Mr. Klein indicated the final reports in these areas would be sent to me by the end of March.) Further it is recommended that OTP and/or OT personnel contact Mr. Klein as regards any useful input and/or interface with the measuring/monitoring program and also request from DOT program descriptions of any other research projects which impact on the use of the spectrum. Also it is recommended that after OTP has become informed on the program, FCC should be briefed on it.

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Mr. Klein explained that Mr. J.A. Hull formerly of the NASA Electronics Research Center and presently an Acting Associate Director at ITS Boulder, was familiar with this program.

Wm. Gamble

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

OFFICE OF THE DIRECTOR

June 2, 1970

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

Dear Mr. Paine:

As a part of the preparatory effort for U.S. participation in the World Administrative Radio Conference on Space Matters being convened in Geneva, Switzerland during June 1971, it became necessary to establish a program to fill certain knowledge voids regarding potential radio interference among satellite and terrestial radio services. This has become known as the Radio Interference Propagation Program and is being carried out under the purview of NASA, assisted by the Department of Commerce, with funding instigated by this office. A steering group of cognizant interests is monitoring the program.

In the course of exercising general radio frequency management functions, and in particular in developing work to be done under the aforementioned program, it appears to this office that there may be a number of other radio wave propagation research programs underway in various agencies of the U.S. Government. The extent of mutual coordination of such research programs to avoid duplication is not readily apparent and there is concern as to the extent to which policy direction has been applied to assure that work being done is responsive to established tasks and missions.

While knowledge of radio wave propagation is essential to effective management of the radio spectrum resource and to efficient radiocommunications, it can also be very costly, and requires skilled engineering talent. Accordingly, it would seem in the best interests of the Government, if information on on-going and planned programs dealing with radio wave propagation research were collected in one office and made readily available to all agencies that may be considering new programs. Possible savings to the Government could result from such an effort in terms of both money and research time. In the light of the foregoing, and to assist in an overall appraisal of the nature and direction of current and planned Government radio wave propagation research programs, a recapitulation of such programs under the National Aeronautics and Space Administration auspices would be very helpful. No format is specified for this recapitulation to permit flexibility for accomplishment by the simplest means.

The assistance of your Administration with this effort would be appreciated. A letter similar to this is being sent to the Secretary of Defense and the Secretary of Commerce.

Sincerely,

WEllhammer

W. E. Plummer Acting

cc: Chairman, FCC.

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FEDERAL COMMUNICATIONS COMMISSION

JUN 1 2 1970

IN REPLY REFER TO:

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Mr. William E. Plummer Acting Director Office of Telecommunications Policy Executive Office of the President Washington, D. C. 20504

Dear Mr. Plummer:

We received and read with interest the copies of your letters, dated June 2, 1970, addressed to the Secretary of Commerce, the Administrator of the National Aeronautics & Space Administration, and to the Office of the Assistant Secretary of Defense, requesting information relative to the program to obtain data concerning potential radio interference between satellite and terrestrial radio services.

As a participant in the group steering the contractual negotiations as part of the study project, and because we are a peripheral user of any propagation data developed by the study, the Commission would greatly appreciate receiving, if convenient, copies of the responses from the agencies addressed.

Sincerely,

Dean Burch Chairman



THE SECRETARY OF COMMERCE WASHINGTON, D.C. 20230

IUL 1 0 1970

Mr. W. E. Plummer Acting Director Office of Telecommunications Management Executive Office of the President Washington, D. C. 20504

Dear Mr. Plummer:

Your letter of June 2, 1970, brings out an area of concern to the Department of Commerce as well as to your Office, that is, the availability of information about existing and planned research on radio wave propagation and the extent to which coordination of this research exists among the Federal agencies. You also ask specifically for a recapitulation of Department of Commerce programs in radio wave propagation research.

As you know, the Institute for Telecommunication Sciences, (ITS), in the Environmental Science Services Administration, performs most of the Department's research in this field. ESSA's Wave Propagation Laboratory also has programs in radio wave propagation, primarily at frequencies higher than those used at present for telecommunications purposes and directed largely toward remote sensing of the earth's environment. These two units and their predecessor, the Central Radio Propagation Laboratory, have provided propagation information to other government agencies, on request, and to the national and international telecommunications community since the mid 1940's.

Attached is a copy of a brochure describing the work of the Institute for Telecommunication Sciences in some detail. Also attached is a brief description of the fourteen program objectives of the Institute for Fiscal Year 1971.

The Institute does have responsibility for a central Federal program of research and services in the radio wave propagation field. However, there is no requirement that other agencies must have their propagation research performed by ITS. Furthermore, ITS does not coordinate or control the research programs of other agencies, nor do we feel it should do so.

There are several sources of information about on-going programs in propagation research. As you know, this Department operates the Clearinghouse for Federal Scientific and Technical Information. The Clearinghouse can supply on short notice brief descriptions of completed unclassified projects funded by the Federal Government. The Science Information Exchange, of the Smithsonian Institution, can supply brief descriptions of on-going Federally sponsored unclassified projects. The Defense Documentation Center can supply information on on-going and completed classified projects.

Beyond these sources concerned with completed and on-going projects, we are aware of no central source of information about future research plans in this area. We do agree with you that it would be in the best interests of the Government to have more complete information on planned wave propagation research. Such information should lead to closer coordination of research as well as wider utilization of the results of the research performed. Further, if a central source for wave propagation information did exist it should also collect and disseminate information on other aspects of telecommunications science and technology in addition to the propagation research itself.

Building on the experience of the staff of ITS and on the information already available from the Clearinghouse and other sources, the Department of Commerce would be willing to provide a central source of a broad range of information on telecommunication science activities in the Government, starting with the field of radio wave propagation. The work of the Clearinghouse and the Science Information Exchange would not be duplicated. Such a focus would enhance the Department's programs in support of the Office of Telecommunications Policy as well as its present programs. The extent of such an effort would depend, of course, on the funding available. Members of the Department staff will be happy to discuss this possibility with you if you would like to pursue the matter further.

Sincerely,

Kour G. Siciliano

Acting Secretary of Commerce

Enclosures (2):

- "Institute for Telecommunication Sciences", (a) September, 1969
- Program Objectives of the Institute for (b) Telecommunication Sciences - FY '71



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

OFFICE OF THE ADMINISTRATOR

AUG 1 1 1970

~ Dennys

Mr. William E. Plummer Acting Director Office of Telecommunications Policy Executive Office of the President Washington, DC 20504

, Dear Mr. Plummer:

As requested in your letter of June 2, 1970, the enclosed information describes some of the National Aeronautics and Space Administration's current and planned programs concerned with propagation.

Several programs are not described as they are not directly concerned with radio wave propagation research, as such. Some are related to basic science and reentry communications. In the process of studying the ionosphere of the earth, the interplanetary medium, and the immediate environments of the planets, use is made of measurements on radio wave links between spacecraft and ground receiving stations. These studies and experiments are unique, and their results are generally made available to the scientific and communications communities.

We plan to provide you with any significant information that may result from these programs and to keep you informed of our future plans.

Sincerely,

* 1

T. O. Paine Administrator

Enclosure



BEC 1970

Mr. W. D. Dean, Jr. Office of Telecommunications Policy Executive Office of the President Washington, D. C. 20504

Dear Mr. Dean:

This is in response to OTM letter of June 2, 1970 and subsequent discussions with my staff concerning defense R&D work in the radio wave propagation area. The work unit summaries pertaining to this subject are attached.

If you require further information concerning this subject, please contact Colonel James H. Terrell, Jr., OX 7-7266.

Sincerely,

Howard L. Yudkin Assistant Director (Information and Communications)

Attachment Work Summaries

DATA FROM DOD WORK SUMMARIES RE: WAVE PROP. 12/70.

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	y V		
	di	RESPONSIBLE	
MODEC	le	GOVERNMENT	PERFORMING
TOPAC	AF	ORGANIZATION	ORGANTZATTON
Sounder Sta. Maintenance	DASA	COM/ADP	SRI
J-6 ADP for Freq. Mgt.	DCA	DCA	Mitre
Mana Studies 0 03. 200 H	DOD	ARPA	ESSA
Wave Studies 0.03-300 HZ	DOL	ARPA	NBS
UC Dreep VC	DOL	ARPA	NBS
IF Dran	DOD	ARPA	NBS
MTP Door	DOD	ARPA	NBS
VLF Prop.	DOD	ARPA	NBS
VLF Edpt. & Prop.	DOD	ARO/D	Ill. U.
SE Asia Comm. Prop.	DOD	COM/ADP	SRI
SE ASIA COMM. Prop.	DOD	COM/ADP	At. Rsch.
wideband COM/NAV Prop. Study	AF	RADC	RADC
Follage Penetration	AF '	RADC	Svracuse II
OTH Prop. Data	AF	RADC	Ravtheon
Prop. for Digital HF	AF	RADC	RADC
VLF-LF Prop. Model	AF	RADC	Bell Aero
Jungle Prop.	AF	RADC	RADC
Very Wideband Sigs. Prop.	AF	RADC	Cornell
LF & HF Prop. Models	AF	RADC	Bell
Environ. Anal. for Space COM	AF	RADC	RADC
EMC Prediction by Computer	AF	RADC	Atl. Rsch.
Comest Widebaud D	AF	RADC	U. of Pa.
AF Compat Prop.	AF	AVWE	O. State U.
Millimotor Ware Come D	AF	AVWE	Teledyne
130 CHa Fant Design	AF	AVWE	U. of Dayton
Space to Space Dath No.	AF	AVWE	U. of Texas
Space to Space Path Noise	AF	AVWE	AVWE
Tropo Prop for Hi Pate Di La L	AF	AVWE	Smyth Rsch. Asso.
Millimotor Wave Dasa	AF	AVWE	NBS
Space Com/Talanchen DD N	AF	AVWE	U. of Texas
Tropo Brop Manager Noise	AF	AVWE	Smyth Rsch. Asso.
Tropo Efforte Cocu-	AF	AVWE	AVWE:
SHE Widehand Dren	AF	AVWE	U. of Dayton
Atmos Turbulongo Effect	AF	AVWE	NBS
Theoretical Prop. Studios	AF	AVWE	NBS
Millimeter Wave Prop & Pager	AF	CRL	Brunel U., UK
Millimeter Wave Prop. & Recep.	AF	CRL	U. of Wash.
Ionospheric Prop. Effects	AF	CRL	Hughes A/C
Millimeter Wave Prop Efforts	Ar	CRL	U. of Pgh.
Theoretical Prop. Studies	AL	CRL	Sylvania
Millimeter Prop. Effects	AF	CRL	CRL
Ionospheric Predic. Techniques	AF	CRI	CRL
Ionospheric Irregularities	AF	CRL	CRL
Arctic HF Disturbances	AF	CPI	CRL
LF/VLF Atmos. Studies	AF	CPL	CRL
rop. for Satcom/Satnav.	AF	CRI	CRL
rop. Studies via Satcom	AF	CRI	CRL
Satellite to Satellite Prop	AF	CDI	CRL
a sector a	4 4 5	CIVLI	CKL

Distrib. DOD only

DATA FROM DOD WORK SUMMARIES RE: WAVE PROP. 12/70. (Cont.)

TOPIC	Funding Agency	RESPONSIBLE GOVERNMENT ORGANIZATION	OPCANTEARTON
Oblique Ionospheric Prop.	AF	CRL	CRU
Theoretical Radio Prop.	AF	CRL	CRI
Polar HF Prop.	AF	CRL	Wach State II
Duct Prop.	AF	CRL	Boston Coll
Auroral Backscatter	AF	RADC	AVCO
Lower Atmos. Radio/Radar Prop.	A	ARO/D	SRI
Fuetia Art & D. Fields Study	A	ARO/D	BPI
Jungle Wave Breen Techniques	A	COM/ADP	COM/ADP
Prop Advanced Breh	A	COM/ADP	COM/ADP
Wave Scattoring	A	EWLab	SRI
Prop. Effects on Good	A	ARO/D	Syracuse U.
Multimode Transmissions	A	Ft. Belvoir	Ft. Belvoir
Theoretical Fred Accien Chudia	A	COM/ADP	Melpar
Rocket Studies of Topoch	A	Army EC	Elec.Tech.Anal.Corr
Wave Prop. re Ant Design	A	AEL	Ill. U.
Phase-Stab. of NSS Signals	A	1 ER	IER
Prop. Studies for EMC	A	Army Labs	Pickard & Burns
Path. Atten. Rsch. Bocum in 162	A	Army EC	HRB Singer
Falling Chap. Experiments	7	COM/ADP	ITS (ESSA)
VLF Whistler Mode	A	Army EC	Rad., Inc.
Wave Prop. Studies via Missiles	N	ONR	SRI
Prop. Prediction via Soundor	1N NT	ONR	Calif. U.
ATS-E Millimetee Wave Prop	1N NT	NSSC	NEL
Microwave Prop.	IV SE	NMC	NEL.
Auroral Echo Doppler	N	NESC	NEL
Diffraction of EM Waves	NT	ONR	Cornell
Sferics Prop. Studies	N	UNR	NYU
Microwave Ducting	N	NASC	NWC
VLF Lightning Signals	N	OND	NEL
	11	ONR	Gen. Rsch. Co.
43	AF	(54%)	and a second
9	DOD	(11%)	
.16	A	(20%)	
10	N	(1.3%)	
	DCA	(1%)	
	DASA	(1%)	
80	TOTAL	100%	
No. Performed by Agency in-house			27
			53
	iGov't	z)	(10)
	(Non-G	Jov't)	(43)
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Most summaries many months to several years old.

ROUGH DRAFT

GVS draft 3/11/71

Honorable Dean Burch Chairman Federal Communications Commission

Washington D.C.

Dear Mr. Burch:

Attached for your information are copies of responses from addressees of my letters of June 2, 1970, concerning wave propagation research programs. Copies of these responses were requested in your letter of June 12, 1970.

Our further study of the basic questions concerns an appropriate national focus for the direction of electromagnetic wave propagation research programs and the maximum effective utilization of information which results from such programs. This is one of the technical areas under discussion with the Department of Commerce Office of Telecommunications (OT) in connection with a review of OTP and OT programs. I expect to consult with you further concerning future developments.

Sincerely,

Clay T. Whitehead Director Office of Telecommunications Policy

FOR AGENDA

Attachment 4 Doc. 13835/1-2.12/4

OFFICE OF TELECOMMUNICATIONS POLICY WASHINGTON, D.C. 20504

February 24, 1971

Mr. Ray Spence Acting Chief Engineer Federal Communications Commission Washington, D.C. 20554

Dear Mr. Spence:

This is with respect to recent deliberations within the Interdepartment Radio Advisory Committee and this office regarding the proposed use by CATV of air traffic control (ATC) frequency bands.

Ar a result, the following points are considered dormano:

a. Unless adequate provisions are taken to preclude interference, there may be situations when CATV equipment malboostion would create hazardous interference to acronautical radio monitors. The enclosed views of the FAA, which are supported by the military services, pertuin.

b. A study by the Institute of Telecommunication Sciences, Department of Commerce, indicates that interference is possible in close proximity to airports. Such interference could be experienced during critical periods of ATC communications.

c. Interference reduction means could be implemented e.g., power limitations, interleaving of assignments, and shutoff devices. If such provisions are not practicable, CATV operations could be excluded generally from the safety service bands as well as the ATC communications, navigation and supporting bands, in particular:

> 108-118 MHz Aeronautical Navigation 118-136 MHz Aeronautical Communications 162-174 MHz ATC support Systems 225-400 MHz Aeronautical Navigation, Communications and Support Systems

d. In view of safety of life considerations, this matter should be explored in depth, including perhaps actual on the air tests to obtain quantitative data, before final procedures/criteria are established.

e. It would appear timely to treat the matter now in view of the foreseen expansion of both CATV and aviation operations.²

The above views are forwarded for consideration in connection with FCC proceedings with respect to CATV standards. This Office is prepared to assist toward insuring accommodations acceptable to all interests.

Dean, Jp Director

Frequency Management

Enclosure

cc: Mr. S. M. Myers

FAA Remarks on Statements of Proposed CATV Use of Air Traffic Control Frequency Bands

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The potential interference presented to ATC services by proposed in-band CATV malfunctions is of concern to the FAA in its role of insuring aeronautical radio safety service reliability. The following comments augment those in docket numbers 13448-2.12/4.2, 13659/1-2.12/4.2, and 13709/2.12/4.2:

1. The TV 30 Hz sweep component would interfere directly with reception of the VOR 30 Hz azimuth pattern, and combine with the other . components (60, 120, 180, 240 Hz) of the ILS signal to derogate 90 and 150 Hz demodulation. Doc. 13415/1-2.12/4.2 attachment by Philip Hamlin, "Mid-Band CA-TVI . . . Real or Imagined Problem?" uses one of the lower powered amplifiers in his examples and compares it with other much stronger sources of interference to discount its relative importance; however, the resulting radiation would be several orders of magnitude greater than the minimum useable VOR signal (experienced at the lower service altitudes) which is flight checked down to the 5 uv receiver input amplitude. Mr. Hamlin's paper does not address the communications problem or link control (162-174 MHz) used to control the VOR. These This repeaters and terminals, which are writen incated on high sites for included range, transmit voice and control service for remote ViF/UHF communications and VOR facilities. CATV malfunctions in these bands. at the same locations could seriously disrupt these functions and remain out of service for days because of inaccessability during ice storms, for example.

2. An earlier precedent established exclusion of low power devices (FCC Rules and Regulations, Part 15, Par. 15.211(6) from the ATC navigation, radiolocation, and emergency communications bands for reasons applicable to the CATV situation. The devices such as door control openers complying with the FCC emission limits were not the major problem; rather, the out of tolerance units took more time to locate, coordinate with FCC, and shut down than was in the best interest of the flying public. These multitude of devices, while not always sclicus individually, contribute to the environment noise and cannot be dealt with reasonably because of the large numbers involved and cumulative effects.

3. A typical aircraft landing approach may entail the following procedures which illustrate the relative importance of interference:

a. An aircraft is directed to descend to 1500 feet on a VOR radial (often a relatively low signal region over a suburban environment where CATV malfunction amplitude could interfere for a mile or so).

b. Upon intersection with the localizer beam, it turns and flies outbound.

c. Upon flying over the 75 MHz marker, the aircraft executes a 180° turn and starts in bound with automatic pilot in "altitude hold" configuration and the flight path computer armed for glide path inter-

d. At about 5 miles from the runway, the glide path is intersected over the 75 MHz outer marker and descent mode established. At typical airspeeds, the time to touchdown is in the order of 2 or 3 minutes depending on surface winds and aircraft type. Flight attitudes under these conditions are critical so that any interference to navigation or communications services during this period is potentially hazardous. CATV malfunction signals could interfere for a mile or so at these altitudes so as to envolve about 20% of the landing operation period, leaving no time to repeat missed "go around" instructions or collision avoidance in the event of interference to the initial communications.

4. If CATV interference occurs near a VHF communications RGAG site, reception from aircraft may be obscured steadily for hours before the situation is corrected. The FAA's remote ATC receive facilities are often located on the approach paths with the potential of CATV interference to the ground receivers.

5. Careful placement of the channel carriers within the ATC bands would limit the already constrained operation, and make the system vulnerable to interference with assignment plans and system characteristics in use.

6. The various papers in the IRAC CATV documentation do not essentially disagree on the interference amplitudes under certain conditions, but rather capress a variety of impressions as to the degree the operational performance is impaired or can be compromised by TV interests as evidenced by the following quotes:

a. Doc. 13415/1-2.12/4.2, industry paper attachment "Are the Midband and Superband Channels Hazardous to Aircraft Navigation?", George Brownstein (consulting engineer for CATV and Telecommunications):

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". . It is apparent from the above that the midband and the superband channels can cause interference either directly or indirectly by a combination of sum and difference video and audio carriers . . . We have enough pollution problems facing us without generating new ones within such a sensitive area as the aircraft navigation and communication band . . . "

b. Doc. 13415/1-2.12/4 industry paper attachment "Mid-Band CATVI . . Real or Imagined Problem", Philip D. Hamlin (Electronic Consultant and Pilot), in describing TVI effects on an ILS approach (CATV malfunction signal exhibits similar characteristics):

> ". . Assessing the seriousness of this interference is difficult. A marginal pilot, or one inexperienced in the phenomena, could have an accident. While in the 'soup', a pilot has no alternative but to assume the 'wiggles' are due to wind shifts and faithfully rack his enormous jet- or Piper- Cub to line up with each erratic movement of the vertical pointer . . .

c. Doc. 13415/1-2.12/4.2 industry paper attachment, "CATV Technical Standards", Archer S. Taylor:

". . First the frequencies from 108 to 118 MHz should rever be used on a CATV ., stem for any purpose . . . The consequences are so dire, and the inconveniences so slight, that there is simply no merit in taking the risk. CATV has enough adversaries without adding aeronauts to the list .

d. Doc. 13761/1-2.12/4.2, attachment, "Possible Radiation from Broken CATV Cables in the 118-136 MHz ATC Band", J. E. Adams:

> ". . . Our conclusions are: (A) With current CATV signal levels, there is no significant danger of a CATV cable break interfering with ATC communications. (B) Either cable break detection devices should be installed or an upper signal level limit of 47 dBmV (in a 50 kHz bandwidth around the video carrier) should be established to ensure no CATV installation will exceed this safe maximum level."

EAA comment: Using the rationale contained in Doc. 15059/1-2.2/4.2 this would equate the 47 dBmV to 233 uv/m at a distance of 2000 feet. Whether the application is high site antenna farm or low altitude approach, receivers with sensitivities of one or two microvolts often operate on a signal to noise margin of only a few dB and would be vulnerable to the level; concluded in A and B above. Mr. Adams reflects a common judgement on page 4 of his paper in the last three sentences of (3):

". . At 100 miles an hour the aircraft would be in this region for less than 41 sees. Obviously for most realistic aircraft flight paths, this time would be but a few seconds. Then, even if severe interference was experienced in this area it is suggested that it would not have serious effects because of the limited area and short duration. . ."

FAA comment: Under close scrutiny, the last two sentences of this quote would not be acceptable to the system user under present flight rules procedures. It is noted that due to the distraction factor, a detectable CATV signal on a landing final approach, for example, would constitute interference in the absence of a desired signal even though the desired-to-undesired signal ratio was satisfactory when present simultaneously. The recommendations for cable fault detection have some philosophical merit, but would be difficult and expensive to install and maintain effectively in practice so that their use is a poor alternative to band exclusion. For example, the SWR detector suggested would be relatively insensitive to a distant break compared to its performance on a short line and is further obscured by the type of terminal distribution.

e. Doc. 13761/1-2.12/4.2. TTS leiter to Mr. Jansky, 3rd pares

". . Because of the low signal which might be expected from the ATC transmitter, the relative interference signal levels from a cable break might be great, but very limited in time. Whether this situation is likely to present a scrious hazard may warrant further examination from both operational and interference points of view . . ."

FAA comment: Communications during this period are often 4 advisory and brief (3-5 seconds), and being of an advisory nature not always require acknowledgment of receipt (often no time in this critical phase of flight) so that CATV interference could blanket a complete communication and neither party would be aware of the unreceived intelligence.

It is recognized that the proposed use of ATC frequency bands by CATV would represent only one of the many types of interference already present; however, its anticipated growth in the immediate future would by sheer numbers of installations make the problem of location, coordination of

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shut-down and correction activities when interference occurs, non-feasible in time and expense if the integrity of anticipated air traffic service is not to be compromised unduly at the cost of safety to our flying public. Now is the time to exclude CATV from the aeronautical bands before it gets established and any significant investments or losses result to either the CATV or aviation services.

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PROBLEM:

To provide a means to quickly determine the compatibility of new proposed foreign space systems.

DISCUSSION:

The proposals of the US for the Space WARC contained procedures for the coordination of earth stations and space systems (Articles 9 & 9A). These procedures will require a rapid analysis by the US of the compatibility of space systems proposed by other nations with existing and proposed US operations.

This project is to develop a rapid means to evaluate these proposed new systems based on the information required by Articles 9 & 9A and to identify what additional information may be necessary to perform this evaluation. The GE report, the US Proposals and submissions to CCIR contain information which will be useful in addressing this problem. SPECIFIC QUESTIONS:

a. Is sufficient information required in the proposed revisions of the Radio Regulations to permit rapid analysis of the compatibility of space systems vs other space systems and space systems vs terrestrial systems? If not what additional information is required and why?

b. What are the cost factors in the implementation and use of a computer program to assist in determining the compatibility between space systems and between terrestrial and space systems? What would be the anticipated response time to complete the analysis contemplated in Articles 9 and 9A, including a dministrative processing? Note time elements involved in proposed revision of Articles 9 and 9A. How does this time compare with manual analysis.

Attachment 6 love Wolib Servis

COMPATIBILITY OF SATELLITE SYSTEMS IN THE BAND 1535-1660 MHz

PROBLEM:

To investigate the compatibility aspects of postulated satellite systems to meet the requirements of aviation and shipping.

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DISCUSSION:

The US has proposed the use of specific bands between 1535 and 1660 MHz to meet the requirements of the aeronautical and maritime satellite requirements. Additionally, proposals to specify bands between 156-162 MHz and in the region 400 MHz to meet maritime satellite requirements are being sponsored by the US. Existing allocation provision permit the use of the band 117.975-132 MHz for aeronautical satellite operations. The purpose of this analysis is to determine the compatibility of postulated space systems to meet aeronautical and maritime needs.

SPECIFIC OUESTIONS:

Based on postulated space systems in the bands between
 1535-1660 MHz to meet aeronautical and maritime needs:

a. What are the optimum configurations of such systems from a EMC standpoint?

b. What is the EMC impact of permitting limited/extensive conventional air ground operation along with satellite systems?

c. What is the possibility of other services sharing the use of the band?

2. Based on postulated maritime satellite systems in either the 156-162 MHz band or the 400 MHz area:

a. What is sharing criteria that is necessary for space system in exclusive bands to be compatible with operations in adjacent bands?

b. What is the sharing criteria if the space systems must share with operation in the same band?

3. Based on postulated aeronautical satellites in the 117.975-132 MHz band, what is the sharing criteria necessary to provide compatibility with existing terrestrial air ground operations?

4. What trade-offs are possible with respect to the above?

-2-

USE OF NEW TECHNIQUES TO IMPROVE THE USE OF THE BAND 2700-2900 MHz

PRORLEM:

What is the impact of pulse compression and frequency agility techniques on the efficient use of the spectrum, particularly at 2700-2900 MHz. DISCUSSION:

The purpose of this effort is to 1) investigate how the use of pulse compression and frequency agility techniques can assist in providing additional radio location facilities in the band 2700-2900 MHz; 2) determine the impact on frequency assignment techniques and procedures and 3) provide computer assistance in the development of frequency plans for mixes of systems using these techniques.

COMPATIBILITY OF SYSTEMS IN THE 7/8 GHz RANDS

PROBLEM:

To determine the extent of compatibility problems in the 7/8 GHz bands. DISCUSSION:

Current operations in the 7/8 GHz bands consist of extensive microwave systems, plus government communication satellites. Current plans provide for the addition of more communication satellites, and new meteorological and earth resources satellite systems in the same bands.

The purpose of this investigation is to determine the constraints that may be necessary for these dissimiliar systems to operate effectively and efficiently. The up-band for the communication satellite and meteorological satellites and the down-band for the carth resources satellites will be in the 8 GHz band. The communication satellite and meteorological satellites will share the 7 GHz band for down-links. The communication satellite systems will consist of both large fixed earth stations and highly mobile/ transportable small earth stations. The meteorological and earth resources satellite systems will probably use large fixed earth stations.

SPECIFIC QUESTIONS:

 What is the distance required between earth stations of all systems to insure compatibility?

2. What is the minimum satellite spacing required between satellites in the meteorological and communications satellite systems (assume geostationary satellites)?

3. What are the geographical constraints on the location of earth stations considering existing microwave systems?

+. Assuming a non synchronous earth resource satellite, what interference might be received in a synchronous meteorological or communications satellite?

-2-

5. How can communication satellite or meteorological earth stations using 8 GHz as up-band be located close (within the confines of a small country) to earth resources earth stations receiving in the same band? Statement of the Problem: A brief statement of the problem.

Discussion: A discussion of:

- 1) events leading up to the problem.
- 2) attempts made to solve the problem and the results thereof.
- 3) extent and nature of the problem.
- 4) the time period in which problem must be solved.
- 5) who will use this analysis and for what purpose.

Specific Details of the Problem: (as appropriate)

- 1) Equipment Characteristics actual or assumed.
- Deployment actual or anticipated deployment of equipments.

3) Employment - How will the equipment be used? For what purpose? During what time period? Under what conditions? What is the impact if the quality of service is degraded?

Questions to be Answered: Provide the specific questions that must be answered by the analysis.

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FIRST PRIORITY STANDARDS ITEMS

1. BACKGROUND:

In the process of frequency management at the National level, the area of spectrum engineering criteria (often called technical standards) has always been accorded a minor role. It is an unpopular area because the most immediate effect of mandatory technical standards is to limit the freedom of choices in design, procurement and operation of radio systems, and to generally increase the time and cost involved in establishing and maintaining a radio communication capability. Decisions to set values on and to adopt engineering criteria have been very slow in the executive branch because the power to make these decisions has been placed in the hands of the organizations to whom the criteria apply. Self-regulation on the part of individual agency users of a limited National resource does not promote the application of criteria which are at the same time both uniform and also appropriately restrictive in the National interest.

Nevertheless, those user Government agencies to whom spectrum engineering criteria will apply must be instrumental in their development. The key to obtaining an effective balance for such criteria in the whole area of spectrum resource management is the provision of a small but effective centralized activity where sound criteria can be formulated under uniform and objective guidelines, and to have a coordinating mechanism on which user agencies may be represented.

2. OBJECTIVES:

The long-term objective of this project is to develop spectrum engineering criteria that are scientifically sound, technologically achievable and economically acceptable for use by OTP as effective spectrum management tools.

The most immediate objective of this project is to continue the development of certain spectrum engineering criteria already initiated, and to initiate several specific efforts most essential to progressive evolution of the long-term objective.

The activities already under way are:

- Guidance of effort in TSC Working Group on Radar Spectrum Engineering Criteria. This effort is in its second phase (criteria for medium/low-power and mobile radars) and is expected to take an additional 1 1/2 years.
- 2. Guidance of effort is TSC Working Group on Land Mobile Minimum Performance Specifications, plus technical and coordinating effort necessary. This effort is expected to require an additional 10 months.

- Guidance and technical development for an effort in TSC Working Group on a study of the Table of Tolerances for the levels of Spurious Emissions. Technical Development is needed for:
 - a. The specification of conditions for measuring the unwanted emissions (bandwidth, modulation), with necessary definitions.
 - b. The development of unwanted emission criteria for transmissions above 960 MHZ (no provisions are in the Table for this part of the spectrum; the most urgent requirement is for the bands from 960 MHZ to 10 GHZ.)
 - c. A revision of the format of the Table to specify in more detail the criteria for the several types of radio services and categories of stations.
- 4. Continuation of an effort to review and determine the parameters of electromagnetic noise emissions that will provide the means of subsequently assessing the interference potential of noise and establishment of appropriate control measures for this form of pollution.

The following aspects of spectrum engineering criteria should be initiated at once:

- 1. A review is required of the OTP Manual to ascertain what technical effort is needed to correct deficiencies in existing provisions, and to formulate a total development plan for Government spectrum engineering criteria. This will require 0.03 man-years in FY 71, and 0.1 man-year in FY 72.
- 2. A determination is needed of those parameters relating to radio receiver influence on spectrum usage. This will require 0.25 man-years. Following the determination of critical parameters, plans should be established for procurement of the technical data which the Government agencies will furnish via the frequency management mechanism. This will require 0.5 man-years. Following the establishment of this plan, it will be desirable to develop advisory evaluations as guidance to the potential users of radio receivers of the various categories.
- 3. The development of measurement procedures necessary to the application of the Radar Spectrum Engineering Criteria is an urgent requirement. This will take 0.05 man-years in FY-71, and 0.50 man-years in FY 72, plus the establishment of a technical advisory group on radar measurement procedures (including the cost of travel reimbursement for a small number of out-of-town members).

AGENDA OTP/OT MEETING

APRIL 14, 1971 1325 G Street

- Electromagnetic Compatibility -- Further discussion on scope and magnitude of over-all area, including:
 - a) Analysis Capability -- Higgins
 - (1) Versar Effort
 - b) Data Base -- Raish
 - c) Automatic Data Processing -- Hailey
 - (1) OT/OEP Meeting
 - (2) Contact with HRB Singer Programmer
 - (3) Review of Work Statement on Time Sharing
 - d) Monitoring -- Jansky
- 2. Status of Action Items:
 - a) Propagation -- Higgins/Haydon
 - b) Specific Problems -- Jansky/Hatfield
 - c) Standards -- Stelzenmuller/Gamble
 - d) Interface between Frequency Management and EMC -- Kirkevold/Hatfield
 - e) Interface between EMC needs and current OTP data base -- Hatfield/Higgins
- 3. Allocations
- 4. Noise
- 5. Receivers
- 6. EMC Education
 - a) Newburn Smith
 - b) Spectrum Management Symposium
- 7. Equipment Characteristics -- Sachs/Freeman Work Statement
- 8. Other Business

Tuesday 4/27/71

Connerce

8:15 Attached is a copy of Walt Hinchman's memo to

Mr. Kandoian dated 4/26 about OT project summaries and activities. He had a meeting with John Richardson Tuesday afternoon (4/27) about the CATV work and the Alaska communications work, particularly the evaluation comparison of domestic satellite applications. Richardson has promised to explain their activities at this Thursday's staff meeting. Thought you should probe the background and future planning of this activity. Walt understands they plan to release a report within the next few days, possibly by Thursday (4/29). He (Walt) suggests that unless you are fully satisfied with their explanation or have reviewed the report yourself, you should insist that they delay its release until next week and Walt can talk with you about it.

If Richardson doesn't bring it up, he thinks you should raise it at the staff meeting. We should call and raise it if staff is cancelled or Richardson and Kandoian don't show up or something.

cc: Dr. Mansur

April 26, 1971

MEMORANDUM FOR:

Mr. Armig Kandoian

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I am currently reviewing the OT/Washington project summaries provided by Bob Lowe (at my request) on April 23. At first glance, there appear to be major inconsistencies between some of the policy-related activities described in these summaries and those which we have previously identified as of primary interest and concern to the OTP.

For example, in Project 9026212, the principal thrust appears to be toward participation in and support to the IEEE CATV Task Force on narrow technical issues. This is not central to any current national policy concerns, and is thus not among the priority support needs of the OTP. These needs have been previously stated to be information on <u>current</u> cable television operations, including such factors as technologies in use and/or planned; installation and operating costs; scalar economies; and existing or firmly programmed special service offerings. Furthermore, Bob Powers was explicitly informed on February 17 that the OTP did not consider support to the IEEE activity to be of primary or even secondary importance vis-a-vis these needs, although individual participation in this activity was not discouraged.

Another activity of great concern to this Office is that referred to in Project 9026235 as "a comparative analysis of domestic satellite filings" in the context of Alaskan communications. Any activity of the Department of Commerce in relation to Alaska communications planning generally, and domestic satellite applications in particular, is of vital policy concern to this Office, as you know from previous discussions and as we have indicated in correspondence with Governor Egan and with the Alaska legislature. A comparative analysis of domestic satellite applications limited in scope to the Federal/State assistance interests of OT could impinge adversely on the Administration's stated policy recommendations for domestic satellite operations, and Alaska's opportunities as well. I believe a comprehensive review of OT activities relating to national policy considerations is urgently needed, beginning with the CATV and Alaskan assistance projects. As I will be out of town from April 28 thru May 2, I suggest we try to meet on Tuesday, April 27, for the first of these reviews. I will phone to arrange a time and place for such a meeting.

Walter R. Hinchman

cc: Mr. Hinchman Subject File Mr. Hinchman Reading File

WRHinchman:sbw

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EXECUTIVE OFFICE OF THE PRESIDENT OFFICE OF TELECOMMUNICATIONS POLICY WASHINGTON, DC 20504

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APR 21 1971

Honorable Maurice H. Stans Secretary of Commerce Washington, D. C. 20230

Dear Mr. Secretary:

As you are aware, Executive Order 11556, which assigned the functions of the Office of Telecommunications Policy (OTP), gave to your Department responsibilities in support of this Office. In recent months members of my staff and the staff of your Office of Telecommunications (OT) have given intensive consideration to the method of discharging those responsibilities. More recently, I have explored this subject at some length with Mr. Wakelin, your Assistant Secretary for Science and Technology.

These discussions have led to general agreement that the following framework will be most desirable for those Commerce activities intended to support OTP:

1. There will be established within Commerce a separate policy support unit, located in the greater Washington metropolitan area, whose function will be to assist OTP. This unit will have its own manager, under the supervision of the Director of OT.

2. Proposed programs for the support unit will be developed by its manager and OTP staff for approval by the Assistant Secretary for Science and Technology and the Director of OTP. It is understood that such programs must remain sufficiently flexible to enable redirection of emphasis as immediate, and to some extent unpredictable, needs of OTP may require.

3. Budget requests for the support unit will be agreed upon between the Assistant Secretary for Science and Technology and the Director of OTP. OTP will actively support such requests before the Office of Management and Budget, and will provide such assistance as Commerce may require in supporting such requests before Congress. 4. In selecting professional personnel for the support unit, Commerce will work in close cooperation with OTP, and with respect to ongoing projects, the lines of communications between OTP and the support unit shall be direct.

5. Transitional arrangements to achieve full staffing of the support unit by the end of FY 72, and to meet the needs of OTP in the interim, will be developed by the Assistant Secretary for Science and Technology and the Deputy Director of OTP.

If the foregoing arrangements meet with your approval, I would appreciate your signing the enclosed copy of this letter and returning it to me. My staff and I look forward to close and fruitful cooperation with your Department.

Sincercly,

Glay T. Whitehead

APPRCVED:

Maurice H. Stans

DATED:

cc: Mr. Scalia Mr. Hinchman Dr. Mansur Mr. Whitehead

AScalia:hy/jm 4/21/71



THE ASSISTANT SECRETARY OF COMMERCE

Washington, D.C. 20230

APR 9 1971

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

Dear Tom:

Mr. Mansur has asked me to review and to comment upon a draft Memorandum of Agreement prepared by your office which concerns this Department's activities in support of the Office of Telecommunications Policy. I am obliged to state that the arrangements contemplated by this document preclude a recommendation on my part that they be accepted by the Secretary of Commerce.

Rather than proceed to a point-by-point discussion of the various provisions of your draft which I judge to be inappropriate, I have taken the liberty of preparing a new document which accords more closely with my own views of what our precise interrelationships should be. From your reading of this new document you will become immediately aware, as I myself have now learned, that our earlier discussions failed to bring to light a fundamental divergence of our respective approaches to the task of managing the telecommunications activities entrusted to this Department. My own view, quite simply, is that management responsibility cannot and must not be divorced from operational responsibility. In consequence of this view, I must decline any suggestion that the Secretary relinquish his control, through appropriate Department of Commerce officials, over those resources which have been appropriated to his care, and with respect to whose use he alone bears the ultimate responsibility.

I am not unmindful of the importance to your own mission of the activities carried out by the Office of Telecommunications. I have accepted the responsibility for ensuring that these tasks are carried out successfully. I believe that the arrangements spelled out in the revised Memorandum of Understanding offer the most promising route to the attainment of our joint objectives. I am sure you feel, as I do, that we must reach an accord on this matter as soon as possible.

Sincerely,

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James H. Wakelin, Jr.

Enclosure

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APR 9 1971

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Sincerely,

JAMES H. WALLIN, JR.

James H. Wakelin, Jr.

Enclosure

THE ASSISTANT SECRETARY OF COMMERCE Washington, D.C. 20230

MEMORANDUM OF UNDERSTANDING

BETWEEN

THE DEPARTMENT OF COMMERCE

AND

THE OFFICE OF TELECOMMUNICATIONS POLICY

The President, through Reorganization Plan No. 1 of 1970 and Executive Order 11556, established the Office of Telecommunications Policy (OTP) in the Executive Office of the President, and assigned to the Secretary of Commerce additional functions and responsibilities in support of the Director, OTP. To fulfill this assignment, the Secretary of Commerce established an Office of Telecommunications (OT) as a primary organization unit within the Department of Commerce. This Office was delegated the responsibility for performance of the newly assigned functions, as well as responsibility for continuance of the Secretary's statutory mission in the fields of wave propagation research and predictions, and in various fields of telecommunications technology and systems research and services.

The purpose of this memorandum is to define, in broad terms, the working relationships which the Director, OTP, and the Secretary of Commerce have established for accomplishing the new assignments by Executive Order 11556.

1. The Office of Telecommunications' role in support of the Director, OTP, will consist of response to specific requests by the Director for telecommunications research, engineering, analysis, and technical services in support of the Director's responsibility for formulating telecommunications policy for the Executive Branch.

2. The Assistant Secretary for Science and Technology and the Director, OTP, will supervise the development of a program memorandum covering the required support to the Director during the next budget year and four years thereafter, in accordance with established procedures for development of the programs and budgets for Federal agencies. 3. OT and OTP staff will cooperate in developing plans, program details, justifications, and estimates to implement the budget year program as agreed by the Assistant Secretary for Science and Technology and the Director, OTP.

4. OT will prepare budgets and supporting materials in accordance with the approved program.

5. Prior to the budget year, the Director, OTP, will request the Assistant Secretary for Science and Technology for support services. These requests will be as specific as is reasonably possible, including a statement of the problem to be researched or analyzed, the purposes which are expected to be attained, the methodology which is anticipated in accomplishing the support tasks, and the resources which are estimated as required for completion of the task.

6. The Assistant Secretary for Science and Technology will respond through the Secretary of Commerce with regard to the availability of staff and funding for the task, and with regard to acceptance or modification of the requested support.

7. Pending the development of the long-range program and budget, as described above, the Office of Telecommunications will reserve \$1.5 million within its \$5 million appropriation request for research and analysis projects in support of the Director, OTP.

MAURICE H. STANS Secretary of Commerce CLAY T. WHITEHEAD Director, Office of Telecommunications Policy

Date

Date

- 2 -

mr Scalias draft

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

OFFICE OF THE DIRECTOR

April 2, 1971

Honorable James Wakelin Assistant Secretary for Science and Technology Department of Commerce Washington, D. C. 20230

Dear Jim:

It seems to me that the arrangements which we have agreed to concerning the Department of Commerce's activities in support of the Office of Telecommunications Policy are of sufficient importance that they should be reflected in a document of some formality signed by the head of each agency. We have drafted a Memorandum of Agreement for this purpose, which Dr. Whitehead has examined and approved.

I believe this accurately reflects the understanding we have arrived at with Mr. Kandoian and yourself, confirmed in the March 10, 1971, meeting between Dr. Whitehead and Mr. Lynn. Before sending it on for the Secretary's signature, however, I want to be sure that you concur in its description of our agreement.

I would appreciate your letting us know by the early part of next week if you have any problems. I will be out of the office, but Walt Hinchman will be available.

Sincerely,

George F. Mansur Deputy Director

Enclosure

Dr. mansuris droft

Honorable James Wakelin Assistant Secretary for Science and Technology Department of Commerce Washington, D.C. 20230

Dear Jim:

As you know, there have been a number of discussions during the past several months concerning the Office of Telecommunications support activities to OTP. These discussions led to a verbal agreement with Dr. Kandoian to establish a new semi-independent be analysis division within OT which would/supported administratively by OT with program supervision being provided by OTP. These arrangements were discussed with you and Jim Lynn in our meeting of March 10.

Accordingly, we have drafted a Memorandum of Agreement, which we believe reflects the discussions and agreements which is attached for your review and approval.

Sincerely,

April 5, 1971

Honorable James Wakelin Assistant Secretary for Science and Technology Department of Commerce Washington, D. C. 20230

Dear Jim:

Based on the understanding reached at the March 10 meeting between Mr. Whitehead, Mr. Lynn, and yourself, we have drafted a Memorandum of Agreement concerning the Department of Commerce's activities in support of the Office of Telecommunications Policy. I believe this accurately reflects the arrangements discussed previously with Mr. Kandoian and agreed upon at that meeting. Before sending it on for the Secretary's signature, however, I want to be sure that you concur in its description of these arrangements.

I would appreciate your letting us know by early next week if you have any problems with this text. I will be out of the office, but Walt Hinchman will be available.

Sincerely,

George F. Marcher 151 Sterge D

mr. Whiteherd

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George F. Mansur Deputy Director

Enclosure

cc: Mr. Whitehead Mr. Hinchman Mr. Scalia Reading File Subj File Rewritten/W Hinchman/tw

MEMORANDUM OF AGREEMENT BETWEEN THE DEPARTMENT OF COMMERCE AND THE OFFICE OF TELECOMMUNICATIONS POLICY

The President, through Reorganization Plan No. 1 of 1970 and Executive Order 11556, established the Office of Telecommunications Policy (OTP) in the Executive Office of the President, and assigned to the Department of Commerce functions and responsibilities in support of that office.

Based on a thorough consideration of alternative arrangements, Commerce and OTP are agreed that the most effective means for providing this support is through establishment of a separate "policy support staff" in Commerce, whose sole function is to serve OTP. This staff, to be located within the greater Washington metropolitan area, will report administratively to the Director of the Office of Telecommunications (OT) or such other Commerce agency as the Secretary of Commerce may subsequently designate. It will, however, receive all program direction from the Director of the Office of Telecommunications Policy, who shall also have primary responsibility for selecting its staff and developing its budget requirements. The ultimate form of this support staff and the various stages in its development are described in the attached Exhibit A, which shall serve as the basic plan for achieving the objectives herein established.

Accepted:

Clay T. Whitehead Director Office of Telecommunications Policy Maurice H. Stans Secretary of Commerce

Date:

Date:

Exhibit A

DEVELOPMENT PLAN FOR OTP SUPPORT STAFF

A. General Plan

The OTP support staff will be established upon selection of a staff manager by the Director of OTP, but in no case later than July 1, 1971. At the time of its establishment, the Director of OT will make available from existing Commerce authorizations twenty full-time positions for recruitment of a core staff. Upon the request of the Director of OTP, and subject to approval by the Director of OT, selected members of the OT staff may also be transferred to the support staff, concurrently with its establishment or at any time until July 1, 1972.

Between July 1, 1971 and July 1, 1972, the Director of OT will make available to the OTP support staff forty additional full-time positions (inclusive of personnel transfers), at a rate of at least three per month. By July 1, 1972, therefore, the support staff will have reached its full complement of sixty persons.

B. Interim Arrangements

Until the support staff reaches its full complement, immediate requirements of OTP must be met, in keeping with FY 1971 budgets approved by the Congress and with FY 1972 budgetary plans and programs approved by the Office of Management and Budget and currently before the Congress. These call for OTP to provide program guidance and leadership for the expenditure of the remaining FY 71 supplemental funds plus \$4 M of the \$5 M funds directly appropriated for the FY 72 Commerce telecommunications program.

The utilization of these resources during the next fiscal year will be as follows:

 At OTP's request, up to 25 members of the present OT staff, primarily from the Institute for Telecommunication Sciences (ITS), will be assigned to OTP support tasks during the period April-December, 1971. These persons will be identified as soon as possible through a series of interviews by OTP staff and subsequent discussions with OT management. During the period of their assignment, they will retain their present organizational and administrative affiliation, but will work directly with and for OTP and the OTP support staff, without program guidance from their parent organization. It is contemplated that their duties may require numerous and lengthy visits to OTP offices in Washington. These persons will be supported by FY 71 supplemental funds during the balance of this fiscal year, and by the level-of-effort funding described below during FY 72.

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In approximately September of 1971, OTP may choose to identify certain of these assigned OT personnel as candidates for the OTP support staff. At that time, OTP and OT officials will resolve the following issues on the basis of the information then available:

- a. Whether these persons can be released from their present positions without seriously impairing OT;
- b., Whether it is feasible and desirable to maintain a contingent of the OTP support staff in Boulder, Colorado;
- c. What continuing studies, if any, might be carried out by ITS personnel through continuation of this level-of-effort type of activity.
- (2) The expected FY 72 direct appropriation of \$5 M will be allocated and expended as follows:
 - a. Frequency Management Support Program...... \$1.85M
 (including the Interdepartment Radio Advisory Committee Secretariat, Electromagnetic Compatibility Analysis, and Automatic Data Processing functions).

- 3'- 1

- c. Other Programs...... \$1.0M (including all OT activities not carried out in response to specific OTP requests or as an integral part of the Frequency Management Support Program).
- (3) A portion of the Frequency Management Support Program activities, particularly those involving electromagnetic compatibility analysis and related studies, may (at the discretion of the Director of OT) be carried out by ITS under appropriate funding arrangements. The Interdepartment Radio Advisory Committee Secretariat, however, its supporting files and data processing facilities, and a small technical support staff, must remain in the greater Washington metropolitan area.
- (4) For FY 72, \$1.80M of the \$2.15M direct appropriations for the Policy Support Program will be assigned for the exclusive use of the OTP support staff. The remaining \$350K will be assigned to ITS to support a level of effort responsive to specific OTP requests. Appropriate overhead charges to cover administrative costs, use of facilities and services, etc., will be levied against both these funds, but they will not be taxed to support other substantive tele-communications programs, consulting services, or planning activities of Commerce.
- (5) In addition to the \$350K level-of -effort funding provided to ITS in FY 72 for studies responsive to specific OTP requests, the manager of the OTP support staff may, at his discretion and with concurrence of the Director of OTP, contract with ITS or other elements of Commerce, or with outside contractors, for studies and analyses.

(6) OTP will seek no special constraints on the solicitation or acceptance of additional appropriations or other-agency funding by OT to support its separate telecommunications activities. As it does for other Federal agencies, however, OTP will impart policy guidance and direction. This includes, for example, ruling on the sponsorship, conduct, and manner of reporting of studies having significant policy implications.

C. Continuing Arrangements

For FY 73 and beyond, the arrangements described above for program management, resource allocation and expenditure, and personnel management within the OTP support staff will continue. The Director of OTP will assume primary responsibility for identifying further resource needs of the OTP support staff and déveloping the justification therefor. These needs will, however, continue to be processed routinely through the Commerce budgetary process.

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

Date: April 28, 1971

Subject: DOC Support in Frequency Management Area

To: Tom Whitehead

The attached reflects continued progress in obtaining OT/ITS support in the spectrum management area.

In summary, we now have them "moving the ball forward" in the areas of analysis capability, data base, ADP support, monitoring, standards, noise and EMC education.

Additionally, specific problems currently facing the Federal Government in the "real world" are being tackled -- tropospheric scatter vs. space communications, VHF air traffic control congestion, altimeters vs. collision avoidance systems, and the development of a quick compatibility determination process for proposed new space systems of other countries.

In short, significant progress is being made and the cooperation of OT/ITS in this particular area has been excellent.

W. Dean, Jr.

Attachment

cc: G. Mansur W. Hinchman

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

Date: April 20, 1971

Subject:

OTP/OT Staff Meeting

To: For the Record

Another in a series of meetings was held on April 14, 1971, in Room 283, 1325 G Street, to improve the joint OTP/OT effort in frequency management.

Those in attendance were:

Name	Organization	Telephone
A second s		· · · · · · · · · · · · · · · · · · ·
Leo A. Buss	OTP	395-4637
Alfred E. Barghausen	OT/ITS	303-447-3384
Stanley Cohn	OT	967-3591
Anthony Corrado	OT	967-5012
D. D. Grombie	OT/ITS	303-447-3816
W Deen Jr. Convener	ОТР	395-5623
William Gamble	OT	967-5012
George Garber	OT	967-5012
Ivman G. Hailey	OTP	395-5623
Dale Hatfield	OT/ITS	- 303-447-3627
George W. Haydon	OT/ITS	-303-447-3583
Brung Higging	OT	967-5012
Denald Lancky	OTP	395-4637
Annia C. Kandojan	OT	967-5171
Alling G. Kandolah	OT	967-4931
C. K. KILKEVOIU	OT	967-3908
KODELL FOWELL	OT	967-3591
George v. Stelzenmuller	01	

The discussion followed the agenda, which was distributed as Attachment 11 to the Minutes of the Meeting of March 16, 1971, with reference to those Minutes to note progress.

1. Electromagnetic Compatibility

a. Analysis Capability

Mr. Higgins distributed copies of a paper he had drafted (see Attachment 1) concerning "Frequency Management in the Band 7125-8400 MHz." He described this as one of the most difficult problems as this band includes a miliatry space system and stations in the fixed and mobile services, and is proposed for further sharing by a meteorological-satellite system and an earth resources satellite system. He outlined what he considered the most urgent aspects of the problem.

The Convener agreed this was a problem requiring early attention and was of the opinion that its resolution would ease the way in settling other problems. He referred to conversations with Mr. Cohn wherein it had been agreed that a procedure should be developed so as to account for each project. In effect, there should be an OT book of projects, with the progress annotated at specified intervals. He asked Mr. Cohn to develop a list of the types of data necessary for analysis in reviewing systems prior to submission of applications for frequency assignment.

The Higgins paper was tabled for further consideration at the next meeting with the suggestion that, meanwhile, comments be given to the author so that he might redraft if appropriate.

* * * * *

Mr. Cohn then distributed copies of a paper entitled "Notes on Analysis Capability" (see Attachment 2) in response to the four points listed in the Minutes of the preceding meeting, i.e, -

> What is interference? Probability of interference. Quality of service. EMC measures.

He suggested a possible need to update the table in Spectrum Engineering -The Key to Progress, which lists the interference levels for various classes of interfering and desired modulations. He noted what he considered a continuing need for a combination of man and computer in successful analysis, with the computer being readily available and capable of versatility. He said the environment may determine whether an equipment will give good or bad performance: The Convener cautioned against quick build-up of an analysis capability without adequate study. He noted a communication gap between the developer and the user and suggested more feedback. In response to Mr. Kandoian, he said he expected the greatest interference problems would occur in bands shared with space. Mr. Higgins noted that the proliferation of high power radars was the big problem a few years ago.

Messrs. Crombie and Haydon will draft a follow-on paper to the one by Mr. Cohn.

(1) Versar Effort

The Convener reported that the FMAC had been briefed on this study at its meeting on March 18.

Mr. Crombie, who had attended the meeting, reported that some thought the approach too bold. He said interference should be considered in two parts - that within channel and that without. But he thought it would take years to categorize the many combinations of possibilities. He asked if out-of-band interference is independent of wave form and how many segments must be examined to develop a rating. versar had said it was not possible to calculate the performance of a piece of equipment, but he disagreed.

The Convener said the goal is to determine the capability of equipment before it is built. After it has been built, he felt it might just as well be tested in the field as to subject it to computer testing.

Mr. Jansky felt the Versar approach had merit and that millions might be saved by subjecting equipment to computer analysis before being sent to the field. He felt the Versar report contained many ideas that should be analyzed carefully.

Messrs. Cohn and Higgins questioned the capability of simulating actual situations with white noise. The former noted there was little mention of antennas and that it would be most helpful if one could predict no interference or a high probability of interference. The latter said the Versar effort was looking to the defining of interference in adjacent channels and expressed the hope that the OT could attack this aspect as a problem, not as a follow-on.

b) Data Base

Mr. Hailey said agencies have been told the OTP/IRAC would ask for no more data until after a full study had been made and there was a good reason for the additional data. In response to Mr. Crombie, he said the number of mobile units in a system must now be reported for the land mobile bands above 30 MHz. The Convener noted that generalized data were not good enough but that specific data were necessary in order to analyze equipment.

Mr. Crombie said he had started a list and would develop it further by the next meeting.

c) Automatic Data Processing

Mr. Hailey reported that the Time Sharing Contract had been put out for bids, that about 45 organizations had attended the bidders conference, and that Mr. Garber is working with prospective contractors. The bids will require detailed examination. The Review Board is scheduled to meet April 26 and 27 and May 3 and 4.

Mr. Hailey also reported that the HRB Singer Contract had been reduced to \$53,000. This will permit the conversion of the record identifier to a type that can be controlled by the agency involved. The contract also provides one-half man-year of maintenance on existing programs. In this respect, it was noted that the contractor's senior programmer had been transferred to Washington to reduce the overhead. He reported on a conversation with Mr. Powell which indicated good prospects for early transfer of an ITS programmer to the Washington OT staff.

The Convener referred to the mass of data that must be examined and manipulated manually prior to the Space Conference and expressed the hope that by the next such conference much of this sort of thing will be massaged by computer. Mr. Hailey said the first step in developing such a capability is in adapting the Table of Frequency Allocations to computer format. A big problem had been in the preparation of data because much interpretation was necessary by people highly conversant with allocations.

Mr. Garber said interested persons have met and discussed the total system design for the OT computer.

In response to the Convener, Mr. Hailey said there appears to be no problem in the changeover from OTP to OT support of the OEP computer on July 1, 1971, but reported that OEP would like a lump sum payment for its services so it would not have to bill for each job. Mr. Cohn said he would see what could be done along these lines.
Meanwhile, Messrs. Jansky and Garber were asked to investigate the possibility of a facsimile type network between OTP, OT Washington and OT Boulder.

d) Monitoring

Mr. Jansky reported that the final draft report on the SRI contract was to be available April 19. After that he would like about a month for review. Messrs. Barghhausen and Higgins have been evaluating the draft segments of the report available thus far and providing comments thereon.

Discussion indicated that, despite much guidance, the contractors thus far had left much to be desired. It was agreed the group would decide on corrective action, if any, after a full review of the final draft.

Further discussion of the noise measurement program of the Urban Mass Transportation Administration (UMTA) of the Department of Transportation led to the conclusion that:

- 1- Mr. Jansky should ask Mr. Klien of UMTA to document its noise measurement capability;
- 2- Mr. Crombie should then evaluate the stated capability to determine how it might be responsive to the OTP/OT needs; and
- 3- After consideration of the foregoing, the OTP might decide to write to the DOT and ask for use of the measurement capability.

It was agreed that Mr. Gamble would assist Mr. Jansky in this matter.

2. Status of Action Items

a) Propagation

Mr. Haydon reported some difficulties in getting the HF models on the UNIVAC 1108, the main reason being the UNIVAC's limitation of 132 units per line versus 136 for the Boulder computer. He said basic ingredients in the development of a program for compatibility would be the setting of a level of interference and the percentage of time such a level could be tolerated. He said he had begun to list those routines which might be useful to frequency managers and found many possibilities. Discussion resulted in agreement that Messrs. Crombie and Haydon would complete the list of routines, with a brief description of each, for introduction into the IRAC. Mr. Stelzenmuller said there was nothing new to report on coordination procedures re propagation research, but the Convener provided a copy of a letter to the Acting Chief Engineer, FCC concerning wave propagation research programs (see Attachment 3).

Mr. Powell noted that a group under HUD is working with the NAE on urban propagation, and that someone from ITS will participate.

It was agreed that ITS should be the coordinator with respect to propagation research and it was noted that Mr. Utlaut is reviewing the work done by the U.S. on propagation.

b) Specific Problems

1) CATV vs Air/Ground

Agreed to delete from agenda as task is completed.

2) VHF follow-on aircraft study for FAA

It was apparent there had been confusion as to what was expected of ITS in this area. Mr. Jansky reported on talks with Mr. Innes and meetings with Messrs. Frisbie, Innes. Kadi and Solsky of FAA concerning ITS/FAA relationships. Outcome was that FAA was to document the whole problem and that ITS would continue with what it had been doing - as a learning device - probably in parallel with ECAC. FAA would be looking to ITS primarily for the statistical approach.

Mr. Hatfield said he was accumulating a data base and developing plots, but indicated a disinclination to duplicate work done by ECAC.

Discussion resulted in agreement that, for this particular problem, the ITS effort would be limited to the probablistic aspect which would not duplicate ECAC work. OTP will so advise FAA, giving manpower limitations as the reason for not duplicating ECAC effort. FAA will be asked to provide a work statement for the probablistic aspect and to define a new problem for ITS.

Mr. Jansky said he would make arrangements for a discussion between Messrs. Hatfield and Innes.

3) Altimeters vs collision avoidance systems in the band 1535-1660 MHz

It was noted that tests were conducted between collision avoidance systems and altimeters (military but not civilian) and that a report is being written. The indication was that interference is involved. This might require an earlier phasing out of the altimeters or a delay in the operation of the CAS.

4) G. E. Computer Program re Orbital Satellites

It was reported that most mechanical problems have been resolved, but more discussion is necessary with General Electric staff. Dan Kane, 215-962-2148, is the G.E. contact.

5) Tropospheric Scatter vs Space Systems in Same Band

Mr. Crombie advised that his staff was devoting much effort to this, that by Friday he expected to be able to predict fields from satellites, and that by the following week he would be able to predict coupling between earth stations and tropospheric receiving stations. Eventually he expected to be able to produce techniques for predicting fields at any location.

He provided graphs (see Attachment 4) showing the orientation of antenna beams from tropospheric scatter stations in relation to the geostationary orbit.

6) Compatibility of Proposed New Space Systems

The Convener said the U.S. Delegation would want to know, taking into account the SJM and other documents, the extent to which Articles 9 and 9A need be amended.

Mr. Crombie said he would provide as much data as he could on this by May 1.

7) Compatibility of Satellite Systems for Mobile Services in the Band 1535-1660 MHz

Mr. Crombie reported no progress because of the pressure of other work.

8) Use of New Techniques to Improve the Use of the Band 2700-2900 MHz

No progress reported. This was withdrawn and will be recast.

9) Compatibility of Systems in the 7/8 GHz Bands

Previously discussed with respect to Mr. Higgins' paper under Item 1.a).

10) Problem Definition

Agreed that the format submitted at the preceding meeting would be used pending amendment. Mr. Cohn was asked to give consideration to inclusion of a time scheduling aspect.

c) Standards

Mr. Stelzenmuller reported in detail as to the progress in this area (see Attachment 5).

Mr. Crombie said he had studied Chapter 5 of the Manual and had given Mr. Stelzenmuller a draft work statement on Standards.

With respect to data standards, Mr. Garber reported that Ad Hoc 109 is developing a package of standards for frequency management. The FCC is using the same standards to some extent in developing its data base for the Chicago project.

d)__Interface between Frequency Management and EMC

This was deleted as it was agreed the necessary action had been completed.

e) Interface between EMC Needs and Current OTP Data Base

Also deleted, as requirement which generated item has been satisfied. Any further related discussion will be treated under 1.b) Data Base.

3. Allocations

Deleted at preceding meeting.

4. Noise

Mr. Cohn reported that he and Mr. Raish had attended the joint meeting of JTAC and ANSI in New York on March 24. In response to an invitation to assist the OTP in this area, the JTAC said it would take the request under consideration and advise. The ANSI indicated that it wished to cooperate but couldn't offer any help for a year or so.

Mr. Crombie stated that ITS would have three of its staff on various ANSI subcommittees and Mr. Gamble said he would continue the development of an outline of what should be done in this area.

5. Receivers

According to the Convener, the FCC had reported at the last meeting of the FMAC on the extent of its codification of receiver standards:

- the high frequency portion was completed;
- the land mobile was about ready to go; and

ALL REAL PROPERTY

- television was to be next.

6. EMC Education

a) Newburn Smith

Mr. Gamble reported that he was collecting EMC manuals from various sources.

b) Spectrum Management Symposium

Item was deleted, noting that the Convener had a copy of Mr. Cohn's paper and there was nothing further to report.

7. Equipment Characteristics - Sachs/Freeman Work Statement

Mr. Higgins reported that he and Mr. Holden were having difficulty in convincing Commerce legal staff of the need for a sole source contract. Effort will be continued.

8. Other Business

The Convener reported on an attempt to inject more order into the handling of projects. He said OTP has developed a Program-Project Book. There are three basic program areas in frequency management: Allocations, EMC and ADP. Each area reflects a detailed two month schedule and a less detailed long range schedule, including target dates applicable to OTP, OT and other agencies. He expressed the hope that OT might develop a similar procedure and that the two could then exchange copies of their Program-Project Books.

* * * * *

Mr. Cohn distributed copies of a flow chart on OT Federal Spectrum Program Support (see Attachment 6).

* * * * *

The next meeting was scheduled for May 12, at 9:00 a.m., in Room 283, 1325 G Street, N. W., with agenda as reflected in Attachment 7.

The meeting was adjourned at 3:00 p.m.

W. Dean, Jr. Director Frequency Management



U.S. DEPARTMENT OF COMMERCE Office of Velocommunications Weshington, D.C. 20230

Date: April 13, 1971 ·

Subject: Frequency Management in the Bands 7125 - 8400 MHz

To: Mr. C. R. Kirkevold

The attached background information and outline of a proposed work program is submitted for consideration at the April meeting of the OTP/OT Staffs in accordance with the discussion of this subject at the March meeting as recorded in paragraph 2,e of the minutes of that meeting. It is felt that the proposed program is specific enough to satisfy some immediate needs and broad enough to provide a sound basis for the general upgrading of our EMC analysis capabilities.

Some of the longer-term tasks identified in the attachment will require some further refinement and development of detail. All programs affecting these bands must, in any case, be subject to adjustment in response to future international allocation agreements and technical criteria as well as to new technical information and system's planning that may be developed nationally.

Hiea

Attachment

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Frequency Management in the Bands 7125 - 8400 MHz

The need for the development of an EMC analysis and prediction capability that will be effective in the support of frequency planning and management in these particular bands has been recognized during discussions at previous joint OTP/OT meetings. On February 17, 1971, the OTP tasked the OT/ITS to study, among others, Problem X, "Compatibility of Systems in the 7/8 GHz Bands". The OTP's problem statement was generated in concern for, problems which may arise from the introduction of two new types of planned space systems into these bands that are already occupied by a complex, high-capacity space communications system and a considerable volume of terrestrial microwave usage.

Major systems under consideration are:

- a. A broad-band, high capacity satellite communications system, currently operational, with numerous earth stations and planned for expansion to provide service to fixed, transportable, and mobile earth stations using earth-coverage and high gain selectivecoverage antennas.
- b. A planned met satellite system.
- c. A Planned Earth Resources Satellite System (allocation provisions contained in the U.S. Proposals —to the 1971 ITU WARC).
- d. Existing fixed multichannel terrestrial radio relay systems carrying radar air traffic control data; computerized power metering, control and billing data; missile test range data, and general military communications.

Either stated or implied in the OTP's problem statement were requirements for the development of an EMC prediction and analysis capability to deal effectively with at least the following questions.

- a. Acceptable satellite and earth terminal separations between the various space systems.
- b. Compatibility measures required to permit a "mix" of synchronous and non-synchronous satellites.

- c. EMC problems and necessary corrective measures related to the operation of space Up-links and down-links in the same band.
- d. Technical criteria and geographic constraints required for sharing between space systems and terrestrial systems considering existing radio relay systems and normal growth factors.

It is apparent that while preliminary study can be initiated, many of the questions involving the space systems that are still in an early stage of planning cannot be answered in a definitive manner until more specific technical and deployment information becomes available. Technical recommendations of the CCIR, decisions of the WARC (with resultant national planning), and the results of the RIPP program, all bear directly upon this area. These events should be monitored closely and their results used in refining our preliminary efforts in developing a comprehensive EMC capability.

On the other hand, it is believed to be prudent and timely to initiate immediate action to review and improve frequency management criteria and management practices affecting the radio systems currently occupying these bands. Such action can be justified from:

- a. The importance and monetary costs of the affected systems;
- b. The unavailability of certain EMC criteria and of applications_oriented EMC prediction techniques for use in management of radio relay systems interface among similar systems and with existing space stations;
- c. The questionable nature of certain existing frequency management practices for radio relay, considering a., above;
- d. The need to "clean the slate" of known weaknesses and imponderables in preparation for the very complex questions related to the future introduction of the newly planned space systems in a manner not to jeopardize existing services and their normal growth.

More specifically, there is an absense of established criteria for use by Federal agencies in the computation and specification of bandwidth for multiplexed emissions (the OTP Manual • refers to Appendix 5 to the Radio Regulations which, in turn, does not furnish a pertinent example for multichannel signals). The some 6,000-plus fixed microwave assignments in the Frequency Record carry handwidth listings varying principally from a few hundred kHz to 25 MHz with a few listings up to 100 MHz. Information accumulated over recent years in the FAS process indicates that bandwith designations from different agencies have been derived from different bases varying among agencies and their equipment suppliers. Such lack of data standardization can be expected to seriously inhibit the effectiveness of EMC analysis programs that must be developed. Also, the majority of new radio relay systems are being planned and activated in these bands for frequency diversity operation, thereby increasing the spectrum requirement as a trade-off against other factors. The OTP's current policy in this regard should be reviewed against the state of up-dated technology and in the light of the newly planned requirements for the band.

Furthermore, present circumstances appear to warrant a review of the allocation table with a view toward possible removal of mobile operations from these bands (only 24 assignments to two agencies are presently listed) and possible future restriction of new fixed transportable operations, SO-16 (some 294 current assignments), to other bands not involved in sharing with space services.

The following outline of a work program is submitted for consideration, based on the foregoing and in support of the OTP's "Problem 8" as referred to the OT/ITS on February 17.

ITS Work Areas:

- a. Develop and recommend standardized criteria for computation and designation of "necessary bandwidth" for multiplexed radio emissions with first priority to be given to FM emissions. This task should take appropriate account of the FCC's current rule-making proceding for modification of their criteria for such emissions but should also include consideration of any modulation peculiarities which may be associated with Federal systems - e.g. radar data transfer, etc. DCA standards may also be worth investigating.
- b. Study the question of the justifiability of frequency diversity as compared with other techniques for insurance of circuit reliability in the light of accepted _ theory and documented experience and make recommendations as to the current OTP policy as expressed in Chapter 8 of the Manual. (Suggest use of Plummer's memo to the IRAC, July 10, 1968 as background and consultation with the FCC as to their long - pending rule-making in this area. Recent CSC study for the FCC also pertains).

C. Develop an applications-oriented routine(s) or model(s) for assessment of interference between terrestrial microwave stations and between such stations and earth stations of the presently operational space communications system. Such routines and models should be modularized in a manner to facilitate future improvement and refinement based upon the results of the RIPP program and other pertinent information that may become available. (The OTP/OT's 1108 automatic data plotting capability is recommended for use of its selective data retrieval and display features in support of interference predictions routines).

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d. Initiate preliminary studies to identify and define the principal EMC problems expected between space systems. Develop EMC analysis techniques based on simulated models of planned space systems using available data. (Work on OTP's Problems 4 and 6 is pertinent here). Augment and refine prediction and analysis models and techniques as more information becomes available as to allocations, technical and sharing criteria, and systems planning for these bands.

OT/Washington Work Areas:

- a. Support ITS in gathering background data that may be needed from the FCC and Government agencies in the development of bandwidth criteria for multichannel microwave. Assist the OTP in reviewing criteria recommended by ITS and in coordinating such criteria through the Tech Sub/IRAC mechanism as appropriate, prior to promulgation by the OTP.
- b. Provide ITS with the current version of assignment records and any desired data plots for terrestrial usage and for the operational space system in these bands. Update these data as may be required during ITS development of EMC routines and models (pending direct ITS access to the 1108). Assist ITS in structuring the EMC routines and models for maximum applicability to frequency management decision-making.
- c. Assist the OTP in securing missing location data and technical information for existing assignment records (some 748 receiver locations and geographical coordinates are missing in the current record).
- d. Provide the OTP/IRAC with any further information needed for their decision as to possible future restriction of mobile and transportable terrestrial operations in these bands.

OTP Areas:

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a. Keep the OT fully informed as to changing national and international planning and regulations affecting these bands.

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- b. Review and promulgate standardized criteria for specification of multiplexed bandwidth at the appropriate time.
- c. Consider the possibility of restricting future terrestrial usage in these bands to fixed stations. Promulgate changes to allocation rules if appropriate.
- d. Furnish continuing guidance to the OT as to the OTP's requirements for EMC analysis and frequency management support as they apply to these bands.



U.B. DEPARTMENT OF COMMERCE Office of Telecommunications Weshington, D.C. 20230

Dete: April 13, 1971

Attnot: Stanley I. Cohn

Subject: Notes on Analysis Capability

Mr. W. Dean, Jr. Director, Frequency Management Office of Telecommunications Policy Executive Office of the President Washington, D. C. 20504

The following notes are in response to the questions raised at the March 16, 1971 OTP-OT Staff Meeting concerning an analysis capability for electromagnetic capability.

(1) What is interference?.

Rather than the classic definition of interference, a signal and receiver oriented definition may be in order. Interference is, therefore, the presence of unwanted signals at the terminals of the receiver which independently, or in combination are of such magnitude and character as to cause a change in the receiver output. The source of these unwanted signals may be from other telecommunication desired signals or manmade noise. Interference always infers the presence of a receiver. It may or may not affect the quality of the receiver's performance. The influence of interference on the quality of system performance is considered under "(4) EMC Measures" below.

(2) Probability of interference.

The occurrence of interference is influenced by a number of factors. Many of these are statistical in nature. Equipment characteristics vary between different serial numbers of the same type of equipment. Propagation variations occur with time and knowledge of propagation losses from prediction techniques are statistical in nature. There are a number of other uncertainties involved in determining interference levels. Among these are the exact position of the equipment (this is particularly prevalent in mobile systems), antenna pointing angles, frequency stability, time on the air (including the probability of two or more signals being simultaneously present to produce intermodulation), operational factors, etc.

Generally speaking, the statistical nature of a problem can be divided into two categories. Those parameters which have a

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statistical variation in time and those parameters which are time invariant but produce uncertainties due to an inaccurate knowledge of the conditions.

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(3) 'Quality of service

Generally, the quality of service is specified by the user. In many cases, the user is ultra-conservative in his specification. In other cases, an overall quality of service is misinterpreted as the quality of the communication link. An example of this is a digital communication link where the overall specification in the order of one error in a million can be transmitted on a channel of fairly poor quality if error detecting and correcting codes are used. It is important that in EMC analysis that the quality of the communication channel be specified and that unrealistic qualities of service not be used.

(4) EMC Measures ;

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As stated previously, the presence of interference may or may not degrade the performance of the system. In many cases, the presence of an interfering signal may be an annoyance but the message content can be read without error. In other cases, (i.e., receiver desensitization) the user may be completely unaware of external interference since it is manifested only in a lower signal level, but it does degrade the performance of the link.

Considerable theoretical and experimental effort has been expended on the subject of degradation. A table in Spectrum Engineering - The Key to Progress (JTAC report) lists an up-to-date table of interference levels for various classes of interfering and desired modulations. This table was compiled by ECAC from various sources and represents the best estimate of these levels that is presently available. Many of the entries, however, are based on theoretical results which have not been validated. Other entries are based on experiments of questionable validity. It would appear that a significant contribution could be made in this area if a systematic examination (including appropriate validation) were made for the various modulation combinations.

(5) Analysis

From the foregoing, it can be seen that any analysis capability which has already been developed or will be developed in the near future will have a number of uncertainties associated with it. At the present time, the state-of-the-art may only allow construction of very conservative prediction models. In fact, it may be that the state-of-the-art may only allow the construction of a good quality cull model for computerization. In fact, the computerized models and combines their results with manual analysis and good engineering judgment to produce acceptable answers.

EXECUTIVE OFFICE OF THE PRESIDENT OFFICE OF TELECOMMUNICATIONS POLICY WASHINGTC D.C. 20504

April 5, 1971

Mr. Ray E. Spence Acting Chief Engineer Federal Communications Commission Washington, D.C. 20554

Dear Ray:

Enclosed for your information are copies of responses from addressees of our letters of June 2, 1970 concerning wave propagation research programs. Copies of these responses were requested in FCC's letter of June 12, 1970.

Our present effort concerns consideration as to an appropriate national focus for improved management/coordination of electromagnetic wave propagation research programs and the maximum effective utilization of information resulting from such programs. This matter is also under discussion with the Department of Commerce Office of Telecommunications.

I will be in touch with you concerning future developments.

Sincerely,

Dean, Jr

Director () Frequency Management

Enclosures:

es: 7-10-70 DOC letter 8-11-70 NASA letter 12-4-70 DoD letter See Attachment 3 to Minutes of March 16, 1971, meeting for copy of enclosures.

ac: W. Hinchman

ATTACHMENT 4



	Approximate Frequency Range, MHz	
	·A 345-470 D 2500-2700 B· 700-1000 E 4400-5000' C 1700-2400 F 7125-7425	
	90'	Ч
	80 [°] 70 [°] 60 [°] 80 [°] 8	
• B • B • B • B • B		
•C •B •B •E •E •E •C •C		
	• B 5 • C.B 50° • E 10° • C 20° • C 50° • C 5	0
0° 20 € 4		

ATTACHMENT 5



U.S. DEPARTMENT OF COMMERCE Office of Telecommunications Washington, D.C. 20230

Date: April 15, 1971

C. R. Kirkevold

From:

To:

George V. Stelzenmulien

Subject: Material reported at OT/OTP meeting 4/14/71.

The report given was roughly as follows:

- Standards being pursued on wide front. OT is making a review and preparing long-term plan for an in-depth program.
- 2. Near-term approach is still characterized by the elements agreed between OT and OTP as contained in previous reports. Some progress is being made by earmarking specific project funding. A run-down by topic followed:
 - a. Review of Chapter 5 of OTP Manual -- this represents a junction of the long-term and near-term plans. Mr. Crombie is working on it. (He reported subsequently there will be a report on this at next meeting.)
 - b. Spurious Table.
 - 1. Spectral density aspect being worked on by Crombie & Stelzenmuller nearly finished.
 - Extension above 960 MHz. One element being developed in a TSC working group. Other elements need attention -- a question of funding.
 - Expansion by service and station category. No progress, a question of funding.
 - c. Radar Criteria. TSC Working Group has already begun on 2d category of radar criteria. Stelzenmuller is collaborating also with RTCM-65.
 - d. Radar Measurement Criteria. OT plans a special group to include other Government and non-Government input, soon as funding can be arranged.

Memorandum To: C. R. Kirkevold

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Page 2 April 15, 1971

e. Receiver Standards. Awaiting FCC action in FMAC. Need attention to identify receiver parameters vital to spectrum efficiency. Also funding question.

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- f. Noise Standards. Need identify parameters essential to spectrum efficiency. No progress.
- g. Land Mobile system standards. Working Group in TSC dormant because of WARC work. No progress.
- h. Microwave system criteria. The expected TSC Working Group will continue to be deferred to permit initial work by OT, in line with Higgins description of project.
- i. Telemetry Standards. Have new NASA contact anxious to help develop input for telemetry standards. Work can start when manpower permits.
- j. Harmful interference criteria. No progress. Must bear in mind ITU definition and criteria when work starts.
- k. Power level criteria for various services and conditions. No progress. Relates to reliability studies.
- Monitoring projects will continue to need coordination and interface with standards efforts, receiver and noise projects to ensure compatibility.



AGENDA OTP/OT MEETING

May 12, 1971 1325 G Street

0900

1. Electromagnetic Compatibility -- Further discussion on scope and magnitude of over-all area, including:

a) Analysis Capability -- Higgins

- b) Data Base
- c) Automatic Data Processing -- Hailey
 - (1) Contract with HRB Singer
 - (2) Contract on Time Sharing
- d) Monitoring -- Jansky
- 2. Status of Action Items:
 - a) Propagation -- Higgins/Haydon
 - b) Specific Problems -- Jansky/Hatfield
 - c) Standards -- Stelzenmuller/Gamble
- 3. Noise
- 4. Receivers
- 5. EMC Education Newburn Smith
- 6. Equipment Characteristics -- Sachs/Freeman Work Statement

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7. Other Business

BD.

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

August 6, 1971

Mr. Thomas C. O'Brien Assistant to the Deputy Assistant Secretary for Environmental Affairs U.S. Department of Commerce Room 3876 Washington, D. C. 20230

Dear Tom:

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I enclose a document entitled "Understandings Concerning Minimum Budget and Staffing Arrangements for Commerce Support to OTP." Its provisions are substantively identical with the items contained in my letter to you of July 29, except for Item A (5)and the Appendix, which have been added pursuant to our discussions last Tuesday and today.

I also enclose a document entitled "Framework for Commerce Policy Support." This is identical to the document which we showed to Mr. Wakelin last Friday.

It is my hope that we can get Messrs. Mansur and Wakelin to initial these documents next Monday. I want to thank you again for your helpfulness in these negotiations.

Sincerely,

Antonin Scalia General Counsel

Enclosures AScalia:hmy - 8-6-71 cc: Mr. Whitehead Mr. Hinchman Dr. Mansur Mr. McCrudden

UNDERSTANDINGS CONCERNING

MINIMUM BUDGET AND STAFFING ARRANGEMENTS

FOR

COMMERCE SUPPORT TO OTP

A. BUDGET

1. Of the original \$5 million budget sought for the Office of Telecommunications, \$2.15 million was identified for the Analysis Division, \$1.85 for IRAC, and \$1.0 million for ITS and OT management costs. Congress later approved a supplemental request of \$160,000 to cover increased personnel costs. This supplement should be distributed proportionately among the three groups within OT, on the basis of the total number of OT personnel projected for each group in the original budget. Assuming 60 individuals in the Analysis Division, 24 individuals in IRAC, and 77 individuals in ITS, this would increase the original budget allocations by \$60,000 for the Analysis Division, \$24,000 for IRAC, and \$76,000 for ITS.

2. The House Appropriation Committee refused to approve two items included in the \$5 million request: an \$83,000 timesharing study for IRAC and a \$170,000 study for the Analysis Division concerning "Technological Characteristics of Telecommunications Services." It is agreed that the time-sharing study will, at OT's option, either be eliminated or conducted with funds allocated to ITS; and that the other study will not be performed, and its \$170,000 projected cost subtracted from the allocation to the Analysis Division.

3. In addition to the above adjustments to the budget of the Analysis Division, an additional \$140,000 should be subtracted to reflect the fact that the Division will not come into existence until August 15, and that hence some of the personnel who were expected to be on the Division's payroll during the period July 1-August 14 will in fact have been carried by ITS.

4. Based on the assumptions and adjustments outlined in paragraphs 1 through 3 above, the Analysis Division will have a budget of \$1.9 million for that portion of FY 1972 from and after August 15. Of this amount, up to \$800,000 will be contract funds, leaving a minimum of \$1.1 million for salary and expense items. It is assumed that this minimum will be expended in staffing the Division as outlined below (see "Staffing" section). If it becomes apparent, however, that staffing is not proceeding at a rate which will consume the full minimum, funds sufficient to bring the total personnel expenditure up to the minimum will be spent for the temporary detail of OT/Boulder employees to the Analysis Division, or, if jointly agreed by OT and OTP, for the performance of Analysis Division work by OT/Boulder.

5. It is understood that OT does not propose to devote any portion of the ITS budget allocation to continued support of all those activities listed under the column "OTP Policy Support" and the activity listed as item 3 (d) under the column "General Technical Support" on the OT Initial FY 1972 Project Plan, dated 7-29-71 and attached as Appendix A. To the extent, however, that OTP wishes such activities to continue, they will be supported from the Analysis Division's budget allocation.

B. STAFFING

1. The following individuals will be permanently transferred to the Analysis Division as of August 15 and will be located in Washington: Richard Gabel, Robert Powers and Jack Cole. In addition, Robert Lowe will be appointed Acting Manager of the Division until a permanent Manager is selected.

2. The following individuals will (subject to their approval) be transferred to the Analysis Division staff as of August 15 and will be located in Boulder, Colorado: Roger Salaman, Dale Hatfield, Donald Ewing, Lester Berry, Jean Adams, Jerome Partch and a secretary to be subsequently identified.

3. In addition to the foregoing ten permanent personnel, twenty vacant slots shall be made available to the Division on August 15, to be filled as soon as possible. By March 31, 1972, twenty more vacant slots shall have been provided, and by June 30, 1972, an additional ten. The build-up to these required 1972 levels shall be made in as gradual and regular a fashion as possible, but it is recognized that in order to avoid an unacceptable level of RIF's the rate of build-up must depend to a large extent upon the rate of normal attrition (through retirements and voluntary resignations) at OT. In any event, however, the required staffing levels of 50 and 60 shall be reached by March 31, 1972, and June 30, 1972, respectively. Both OT and OTP will support a personnel funding level for the Analysis Division in FY 1973 which will at least enable retention of the 60-man staff. If, however, such funding is not approved then the June 30, 1972, staffing level of 60 will be adjusted downward.

- 3 -

	OT INITIAL FY 1972 PROJECT PLAN APPENDIX A JMR: 7-29-71							
	DISTRIBUTION BY AGENCY PRIMARILY	SERVED, BY SUBJI	ECT, AND BY LOCATION					
Budget Activity Activity 1. Services for Frequency Management and Usage	Freq.Mgt OTP General. Support Support.	Total Spectru OTP Researc	um Other Total	TOTAL <u>FUNDING</u>	<u>Wash</u> <u>Boulder</u>			
a. Asomt of Radio Freg.								
IRAC Secretariat	1028	1028		1028	1028			
Timeshare Terminal	83	83	•	83	83			
Spectrum Management	75	75		75	75			
Subtotal, Subactivity la	(1186)	(1186)		(1186)	(1186)			
b. Predic.& Compatibility Anal. Svc.								
ENC analysis	175	175		175	175			
Spectrum engineering	52	52		52	52			
ECAC consulting	25	25		25	25			
Subtotal, Subactivity lb.	(252)	(252)		(252)	(77) (175)			
Total, Activity 1	(1438)	(1438)		(1438)	(1263) (175)			

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Or. Initial FY 1972 Project Plan (cont	d) -	2 -			· · · · · · · · · · · · · · · · · · ·		JMR: 729-71
Budget Activity Freq.Mgt Activity 2. R&A for Policy Formulation	OTP General Policy Technical Support Support	Total OTP	Spectrum Research	Other <u>Technical</u>	Total DOC	TOTAL FUNDING	Wash Boulder
a. <u>Prep.for Int'l Conf</u> . ITU/CCIR/CCITT participation	50 2/S Boulder	50				50	5()*
Subtotal,Subactivity 2a	(50)	(50)				(50)	(50*)
b. Economics of new Comms. Services	aler (Powers)						
Economic support CATV distrib. Bulk & specialized comm. networks	42 Wash. (gabel) 47 Wash. (gabel)	42				42	42# 47 ø
Subtotal, Subactivity 2b Total, Activity 2	(89) (139)	(89) (139)				(89) (139)	(89) (89) (50)
*Stelzenmuller work order 12k Powell							
#5k for Wieder in Boulder ø5k for Ed Hayden, Boulder							

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OT Initial FY '72 Proj Plan (Cont'd)	¥ ,	-	3 - 1				JMR:	7-29-71	
Budget Activity Freq.Mgt	Policy Support	General Technical Support	Total OTP	Spectrum Research	Other Technical	Total DOC	TOTAL FUNDING	Wash Boulder	and statistics and
Activity 3. Utilization of T/C Tech		41						1.7	and the second
a. <u>Technol.Charact.of T/C</u> Services	6	Bundder)							1. Maria
Telenet Interconnection criteria	50 ITS (Dettaas	50				50	50	Ladonevaska
Satellite Comms.sharing		Hull 50 (IT	50				. 50	50	d stream
Mobile comms.technology		Cramble 74 J. Bould	94 74				74	74 ø	
Applications of comm.theory					100	100	100	100	- 10
Cable and guided wave sys.		Gallawa68	68				68	68	
Subtotal, Subactivity 3a.	(50)	(192)	(242)		(100)	(100)	(342)	(342)	-
b. Extension of Radio System preds.		··							
EHF communications				100		100	100	100	1
Mm wave trans.spectro				55		55	55	55	
Tropo.wave prop.& radio meteor.				100		100	100	100	1
Iono.heating & modification				100		100	100	100	
Iono.& surface wave propa- gation				100		100	100	100	-
EM theory & antenna research				50		50	50	50*	
VHF/UHF sys.& prop.mod.devel.		$w \to \log_{1,d,w} v_1 \overset{\mathrm{out}}{\longrightarrow}$	55 ¹	70		70	70	70	
Prediction services				75		75	75	75	+ .
Subtotal, Subactivity 3b.				(650)		(650)	(650)	(650)	× • -
*J. Wait *Incl Wait Proj ø25k for Wash - Powell									

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OF Initial FY 1972 Project Plan (cont'	d)	·	4 -	e .	· · · · · ·		JMR:	7-29-71
Budget Activity Freq.Mgt	OTP Gen Policy Tec Support Su	neral hnical 7 pport	OTP	Spectrum Research	Other Technical	DOC	TOTAL FUNDING	ash Boulder
Activity 3. Utilization of T/C Technology (cont'd)								
c. <u>Multiple Use & Sharing</u> of Rad. Spec.								
Subtotal, Subactivity 3c.		· ·						
d. Information Development and Mgmt. Technical consulting &		- Bound	en)		50	50	50	50
Resource inventory & information base		LOO TO (Sale	100				100	100
Subtotal, Subactivity 3d. Total, Activity 3	(100) 292)	(100) (342)		(50) (150)	(50) (800)	(150) (1142)	(150) (1142)

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OT Initial FY 1972 Project Plan (cont'd)

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Budget Activity Freq. Mgt	OTP Policy Support	General Technical Support	Total OTP	Spectrum Research	Other Technical	Total DOC	TOTAL FUNDING	Wash	Boulder
ctivity 4. Improvement of Gov't T/C Systems		4							
a. Extension of Freq Asgt.Capability EMC capability develop- 175			175				175		175
Radio spectrum occupancy 167			167				167		167 ø
Data processing development 70			70				70	70	
Subtotal, Subactivity (412) 4a.			(412)				(412)	(70)	(342)
b. Anal.of Fed.Gov't T/C Expenditures Model T/C Systems Anal.for Fed. Gov't	95 Withingthe	50 175 (Boy make)	ананар 50 95				50 95	95	50
comms. Subtotal, Subactivity 4b.	95	50	145				145	95	50
Assistance to State & Local Gov'ts. State and local asst. Subtotal, Subactivity 4c	48 Washing (48)	ton Hey)	48				48 (48)	48	(202)
Total, Activity 4 (412) , FUNDS COMMITTED (1850) RESERVE: Policy Support RESERVE: Director,OT	(<u>143</u>) (<u>332</u>) 1500	(50) (342)	(2524) (2500	(650)	(150) 83	(800) 83	(<u>3324</u>) (<u>3500</u> 83	1565)	(<u>1759</u>) 83
GRAND TOTAL (1850)	(1832)	(342)	(4024)	(650)	(233)	(883)	(4907)	8065)	1842)

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FRAMEWORK FOR COMMERCE POLICY SUFFORT

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1. Commerce's policy support function will be performed by a separate unit within the Office of Telecommunications Policy, to be known as the Analysis Division. This unit shall be located in the greater Washington metropolitan area. During FY 1972 certain members of the Analysis Division shall be located at OT/Boulder, and this arrangement will be continued as long as OT and OTP find it to be useful to the overall program.

2. Proposed programs for the Analysis Division will be developed by its manager and OTP staff for approval by the Assistant Secretary for Science and Technology and the Director of OTP. It is understood that such programs must remain sufficiently flexible to enable redirection of emphasis as immediate, and to some extent unpredictable, needs of OTP may require.

3. Budget requests for the Analysis Division will be agreed upon between the Assistant Secretary for Science and Technology and the Director of OTP. OTP will actively support such requests before the Office of Management and Budget, and will provide such assistance as Commerce may require in supporting such requests before Congress.

4. Selection of the Manager of the Analysis Division and its professional personnel shall be made with the concurrence of OTP. In order to facilitate exchange of information, and thereby to enable the Analysis Division to provide the close support required, the lines of communication between OTP and the Analysis Division shall be direct.

June 1, 1971

Commerce

PSD

Honorable Maurice H. Stans Secretary of Commerce Washington, D. C. 20230

Dear Mr. Secretary:

I have reviewed your May 13 letter, and the enclosure, concerning proposed Department of Commerce support to this Office pursuant to Executive Order 11556. I am sorry to say that the suggested arrangements would neither provide the type and amount of support this Office needs, nor comply with previous understandings with the Office of Management and Budget.

As you may recall, I concluded a general understanding on this matter last summer with Mr. Tribus. After months of negotiations, we thought we had reached a clear agreement on details with the Office of Telecommunications (OT) staff last February, but that was ultimately overturned at a higher level--we gather at the instance of the same OT personnel with whom we had agreed. My letter of April 28, and the proposed Transitional Arrangements which I simultaneously delivered to Mr. Wakelin, were the product of extensive further negotiations which reached the level of discussions between myself and your General Counsel, Mr. Lynn, your Assistant Secretary for Science and Technology, Mr. Wakelin, and your Assistant Secretary for Administration, Mr. Jobe, Until receiving your reply, I was confident that all provisions had finally been agreed to.

I deeply regret, therefore, that your reply made substantial alterations in my letter and the Transitional Arrangements. Our attempt to establish an effective working relationship with OT, which has now consumed the better part of a year and considerable effort, appears as far from success as ever. Meanwhile, we have yet to receive a single useful input to the policy issues we are charged with addressing and see no prospect that this situation will improve in the immediate future.

Some time ago, I expressed to you my concern over the general direction and attitude of OT--in particular, its inflexibility as to management approach and its apparent inability to comprehend the role of broad technical and economic analysis in the policy-making processes of government. Our thwarted efforts to reach a satisfactory arrangement for OT support have fully confirmed those misgivings, and have in addition destroyed my confidence in OT's good faith desire to cooperate.

Over the past months, I have been forced to rely increasingly on other sources of information and analysis to meet the needs of this Office in carrying out its policy responsibilities. Although I remain of the view that Executive Branch initiatives and positions in the communications field can best be developed by establishing a permanent and close policy analysis support capability for OTP within the Department of Commerce, I do not see the makings of such a capability in the present OT structure or the proposed OT arrangements. Even more important, I see no inclination or desire on the part of OT management to provide the type of support which we need. A frank discussion between my Deputy and Mr. Kandolan following receipt of your letter has convinced us that the expenditure of further efforts to achieve an arrangement which is basically not desired by OT would be fruitless.

I therefore see no alternative but to limit my request for Commerce support in FY 72 to \$1.85 million; this is the amount necessary to fund the IRAC Secretariat and associated electromagnetic compatibility analysis services. Needless to say, it is not lightly that I face the prospect of abandoning almost a year of effort. If you believe that your personal intervention may alter the basic direction of OT, I would be happy to discuss the matter with you.

Sincerely,

Clay T. Whitehead

SCALIA/HINCHMAN:hmy 6-1-71 cc: Mr. Whitehead - 2 Mr. Hinchman Scalia Subj File Chron File bcc: Mr. Jobe Mr. Wakelin Office of Telecommunications Policy Route Slip

To 5/14/71 Clay T. Whitehead George F. Mansur 7 Nino Scalia Will Dean Walt Hinchman Charlie Joyce Jack Thornell Frank Urbany. Steve Doyle Bill Lyons Brian Lamb Linda Smith Eva Daughtrey Timmie White Judy Morton Elaine Christoff SUSPENSE: COB REMARKS: Walt - haw about this '

THE SECRETARY OF COMMERCE Washington, D.C. 20230

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MAY 13 1971

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

Dear Mr. Whitehead:

Your letter of April 21, 1971, refers to responsibilities given to my Department by Executive Order 11556 in support of the Office of Telecommunications Policy (OTP). It proposes a framework for Commerce activities intended to support OTP.

The proposed framework appears to relate only to activities that you refer to as "policy support." It is my understanding that other supporting functions will be conducted under established arrangements of organization and direction, without the need for explicit agreement.

With respect to the direct communications referred to in paragraph 4 of your letter, I understand that such communications are intended solely to racilitate the exchange of information between OTP personnel on the one hand, and the manager of the policy support unit on the other.

It also appears to be implicit in your letter that either you or I may reexamine the approved arrangements at any time for cause.

If the above concepts may be incorporated into our relationship by this letter without objection by you, I am happy to approve the framework you propose by countersigning and enclosing a copy of your letter.

As provided also in your letter, transitional arrangements developed by Assistant Secretary Wakelin with my full concurrence are also enclosed for the consideration and approval of your Deputy Director.
I am most pleased, as you must be, with the increased strength that these arrangements will bring to the Executive Branch in telecommunications matters.

Sincerely,

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met Sta an ne Secretary of Commerce

Enclosures

TRANSITIONAL ARRANGEMENTS THROUGH FY 1972 FOR THE POLICY SUPPORT UNIT IN THE DEPARTMENT OF COMMERCE TO ASSIST THE OFFICE OF TELECOMMUNICATIONS POLICY

- 1. The manager of the policy support unit will be selected as soon as possible but at least by June 1, 1971.
- In FY 1972, assuming a total OT appropriation of \$5M, \$1.5M will be allocated to the policy support unit for the implementation of its program.
- 3. The conclusions and recommendations of the telecommunications issue study being conducted for the Office of Management and Budget will be taken into account in any modification of the above distribution of funds between the policy support activities and the other activities of the Office of Telecommunications.
- 4. Staffing of the policy support unit will be determined by (1) the funds available; (2) the vacant positions that become available through attrition, administrative action, and assignments of existing personnel to available reimbursable work; and (3) the qualifications of existing personnel for work assignments in the policy support unit. The Director, Office of relecommunications. will reassign twenty personnel, ten from the Boulder and ten from the Washington area, and will make five vacant full time positions available to the policy support unit by July 1, 1971, and twenty-five more personnel by July 1, 1972.

APPROVED: Ques A. halle.

James H. Wakelin, Jr. Assistant Secretary of Commerce for Science and Technology

George F. Mansur Deputy Director Office of Telecommunications Policy

May 13, 1971

Date

Date

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

DIRECTOR

April 21, 1971

Honorable Maurice H. Stans Secretary of Commerce Washington, D. C. 20230

Dear Mr. Secretary:

As you are aware, Executive Order 11556, which assigned the functions of the Office of Telecommunications Policy (OTP), gave to your Department responsibilities in support of this Office. In recent months members of my staff and the staff of your Office of Telecommunications (OT) have given intensive consideration to the method of discharging those responsibilities. More recently, I have explored this subject at some length with Mr. Wakelin, your Assistant Secretary for Science and Technology.

These discussions have led to general agreement that the following framework will be most desirable for those Commerce activities intended to support OTP:

1. There will be established within Commerce a separate policy support unit, located in the greater Washington metropolitan area, whose function will be to assist OTP. This unit will have its own manager, under the supervision of the Director of OT.

2. Proposed programs for the support unit will be developed by its manager and OTP staff for approval by the Assistant Secretary for Science and Technology and the Director of OTP. It is understood that such programs must remain sufficiently flexible to enable redirection of emphasis as immediate, and to some extent unpredictable, needs of OTP may require.

3. Budget requests for the support unit will be agreed upon between the Assistant Secretary for Science and Technology and the Director of OTP. OTP will actively support such requests before the Office of Management and Budget, and will provide such assistance as Commerce may require in supporting such requests before Congress.

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4. In selecting professional personnel for the support unit, Commerce will work in close cooperation with OTP, and with respect to ongoing projects, the lines of communications between OTP and the support unit shall be direct.

5. Transitional arrangements to achieve full staffing of the support unit by the end of FY 72, and to meet the needs of OTP in the interim, will be developed by the Assistant Secretary for Science and Technology and the Deputy Director of OTP.

If the foregoing arrangements meet with your approval, I would appreciate your signing the enclosed copy of this letter and returning it to me. My staff and I look forward to close and fruitful cooperation with your Department.

Sincerely,

Clay T. Whitehead

APPROVED: annice H. Stans

Maurice H. Stans

DATED:

May 13, 1971

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

DIRECTOR

April 21, 1971

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Sincerely,

Clay T. Whitehead

APPROVED: assinge H Atans

Maurice H. Stans

DATED:

May 13, 1971

August 24, 1971

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Memorandum for Mr. Armig Kandolan:

Subject: OT Program Memorandum for Fiscal Year 1973

Mr. Whitehead has asked me to respond to your request for guidance concerning the OT Program Memorandum of July 10, 1971, in light of projected OTP support requirements and the agreement recently reached concerning those.

With appropriate clarifications necessitated by these agreements, we find ourselves not too far apart on most of the proposed program for FY 73. As will become apparent in the following detailed discussion, we do question the need and justification for your Fourth Entity Program on Government Telecommunication Systems and recommend that it be consolidated with the Third Entity Program, after shifting some of the projects therein to other programs.

We have inserted in the tables on pages OT-9-12 those changes in allocations which result from our current agreement concerning FY 72 funds, as well as our projected requirements for Frequency Management and Policy Support activities in succeeding years. These will of necessity alter the various subtotals and totals, as will our suggestions concerning other programs. We have not attempted to make changes in these latter items except in the case of FY 72 where it was necessary in order to reflect the recent agreement.

The following is an itemized discussion of the comprehensive program plans beginning on page OT-12.

Entity Program 1: (pages OT-12 to OT-17)

As noted on previous occasions, the distribution of frequency management support functions among the several program elements seems to us an unnecessary and confusing complication. While we can appreciate the desirability of separating EMC development activities

Mr Whitehead

to some extent from routine EMC service operations, we find it very difficult under the present circumstances to identify and support the total frequency management support effort. Accordingly, we recommend that this entity program be titled "Frequency Management Support," and that all EMC development and service tasks be incorporated therein, as noted in the attached revision. This need not interfere with the separation of these activities to the extent necessary for effective operation, and it provides us a much clearer understanding of the total level of effort for this area in FY 72, 73, and succeeding years. This understanding is essential if this is to be identified as a mandated support activity for the OTP, as indicated.

As you will note, we have incorporated the EMC development activity at an increase of roughly \$150 K, assuming a present base of \$450 K per our previous understanding. This results in a net increase of \$750 K for the frequency management support area, which applied to the FY 72 base of \$1.85 M results in a \$2.6M total. However, since \$300 K of this amount represents a non-recurring computer changeover, the base for computing growth beyond FY 73 is reduced to \$2.3 M. Growth has then been computed at a 20%/yr. rate.

On page OT-13, we suggest deletion of the last full paragraph, which seems to contribute little to the discussion. It is indeed correct that spectrum management alternatives are being studied elsewhere, not only in the OTP program but in the OT policy support program as well: but there seems little reason to refer to these activities in this discussion.

Following page OT-17, we would suggest inclusion of the EMC development program description. We take this to encompass the efforts identified as "extension of frequency assignment capability" and multiple use and sharing of radio spectrum in the table on OT-10; however, we are unable to find a detailed description for the first of these under Entity Program 4 beginning on page OT-39.

Entity Program 2: (pages OT-18 to OT-26)

On page CT-18, we have indicated the necessary changes in personnel and funding additions to bring this effort in line with the overall needs of CTP for FY 73, as well as the tentative distribution of this support. While this is largely self-explanatory, it may be worth noting that this is based on a \$2.5 M total effort (20% increase over the roughly 2.1 M to be spent in FY 72) and the planned distribution of this effort as set out in previous planning guidelines for FY 72. There is, of course, a slight discrepancy owing to the unidentified policy support effort carried out prior to the effective date of our recent agreement.

On page OT-21, we suggest deletion or replacement of the parenthetical expression in line 1, which seems unnecessarily specific and argumentative. A similar comment applies to the items stricken from the first paragraph of OT-22.

On page OT-24, we feel that items 4 and 5 should properly fall under the preceding category, i.e., Telecommunication Services on page OT-23.

Entity Programs 3 and 4:

These programs encompass those activities which fall within the broad mission of the Department of Commerce yet outside the area of direct OTP support. We are unable at this time to comment definitively on the specific studies described or the overall level of effort proposed, pending the results of the issue study now underway. However, we are prepared to offer the following general comments for planning purposes:

- 1. Assuming a favorable outcome of the issue study and the identification of satisfactory measures for making any necessary reorientation of programs and parsonnel, the OTP would not object to an increase of up to 20% of the total. non-OTP portion of the FY 72 OT budget, including both direct and other-agency funds. This could result in up to \$1.25M in increased funds for FY 73 assuming a total non-OTP FY 72 effort of \$6.25M.
- 2. In subsequent years, the OTP expects to be much less involved in the preliminary planning and review of non-OTP portions of the Commerce telecommunications program. We therefore must refrain from commenting on the proposed

growth in these areas, except to note that a growth rate of 10-20% of the total program seems to be the maximum the OMB or Congress are likely to approve in the current economic climate. As noted in previous discussions, we are generally in favor of providing any justified growth through increased direct appropriations, rather than expanded other-agency funding.

- 3. We believe there is sufficient overlap in the scope and objectives of program areas 3 and 4 that they could better be considered a single area, under the title now given to area 3. As previously noted, we specifically request that the various EMC development projects now identified with area 4 be shifted to area 1. Of the remaining projects in area 4, several are parallel or duplicative of these in area 3, with a particular slant toward government uses of telecommunications. We feel these can all be handled under one or another of the first 3 programs, using the following criteria:
 - a. If the activity involves significant policy considerations and implications, it cannot be realistically divorced from OTP concern and should be proposed for inclusion in one or another of the OTP support programs. This applies for both government and non-government uses,
 - b. If the activity does not involve significant policy implications, or those implications are so distant as to be difficult to discern, the activity can clearly be accommodated under area 3, Utilization of Telecommunications Technology, whether government or non-government.

Summary

I hope the above comments and recommendations are sufficiently detailed to meet your needs in making the necessary revisions to your program memorandum. I have attached a summary table of