July 7, 1970

officer

Dear Frank:

I appreciated receiving your kind words of congratulation. The importance and challenge of this new undertaking are, of course. very exciting.

I do feel very strongly that this new office can be successful only to the extent it encourages and seeks out constant contact with those in government, industry, and the public who are concerned with the future of telecommunications in this country. I will look forward to working with you in that context and hope we can call on you from time to time.

We should get together soon after the OTP gets organized (probably carly August) and discuss the range of educational telecommunications issues, specifically including the spectrum matters you mentioned.

Thank you again.

Sincerely,

Clay T. Whitehead Special Assistant to the President

Mr. Frank W. Norwood Executive Secretary Joint Council on Educational Telecommunications 1126 Sixteenth Street, N. W. Washington, D. C. 20036

cc: Mr. Whitehead Central Files

GTWhitehead;jm

JOINT COUNCIL ON EDUCATIONAL TELECOMMUNICATIONS 1126 Sixteen #h Street N.W., Washington, D.C. 20036 202 / 659-9740

June 29, 1970

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

Dear Tom:

Congratulations on your nomination to the OTP post. You've been my favorite candidate all along.

. I trust that the Senate will do its part shortly, so perhaps I ought to send you the enclosed before there are additional official channels to go through. You already know of the JCET's interest in making sure that the U.S. position in Geneva next year includes support for the assignment of 2500-2690 MHz for space-to-earth instructional TV and <u>other</u> forms of educational communications, co-equally with present terrestrial uses in this country.

Walter Hinchman has been a great help in interpreting the state of the art and in explaining it to the educational community. We're particularly indebted to Walt for turning the Corporation for Public Broadcasting on -- a task I attempted on my own with little success.

A recent CCIR meeting which Walter and I attended appeared to offer ample evidence that space and terrestrial sharing is genuinely possible, not only with ITFS in the USA, but even with 50-hop microwaves in other Zones.

For your information, and to start a JCET file in your new office, enclosed are our comments and reply comments to the FCC, and a copy of John Macy's oral presentation before the Commission. I have constantly to remind some of my constituents that we did not, realistically, win any great victories at the Commission. All we did do is Dr. Clay T. Whitehead June 29, 1970 -2

survive a crisis at which, had we not expressed education's concern and interest, we should most certainly have blown the ball game.

From this point forward, the Industry-Government group and, in particular, OTP is going to be of paramount importance. I hope that we can talk more about this, either officially or unofficially. Please let me know what my next step should be.

In the meantime, congratulations. You know you have whatever professional and personal support I can offer.

Cordially,

Frank W. Norwood Executive Secretary

Enclosures

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

In the Matter of

An Inquiry relating to preparation for a World Administrative Radio Conference of the International Telecommunication Union on matters pertaining to the radio astronomy and space services.

DOCKET NO. 18294

Before the Commission:

COMMENTS OF THE JOINT COUNCIL ON EDUCATIONAL TELECOMMUNICATIONS

Comes now the Joint Council on Educational Telecommunications (JCET), and, through its attorneys, files its comments with respect to the SIXTH NOTICE OF INQUIRY in the above-referenced proceeding.

 The JCET is a consortium of national and regional nonprofit educational organizations. Its Constituent Numbers are: American Association on Higher Education, American Association of Junior Colleges, American Association of School Administrators, American Council on Education, Corporation of Public Broadcasting, Council of Chief State School Officers, Department of Audiovisual Instruction, NEA, Interuniversity Communications Council (EDUCOM), Great Plains Instructional Television Library, Institute for Development of Educational Activities (/I/D/E/A/), National Association of Educational Broadcasters, National Association of State Universities and Land-Grant Colleges, National Catholic Educational Association, National Education Association, National Educational Television, National Instructional Television Center, National Public Radio. Its Associate Members are: Southern Educational Communications Association, Indiana Higher Education Telecommunications System, and Western Educational Society for Telecommunication.

2. On January 17, 1969, the JCET filed comments in response to the Commission's Third Notice of Inquiry in this docket, directing the Commission's attention to the need to give fullest consideration to the present and future requirements of education and other public service users in the preparation of the United States position in the forthcoming World Administrative Radio Conference. We said in that filing, ". . . the JCET urges that all appropriate action be undertaken to keep open the maximum opportunities for education here and abroad to have access to both space and ground communications."

3. More recently, in response to the Commission's Fifth Notice of Inquiry in the instant proceeding, comments were filed by JCET's Constituent Member, the National Association of Educational Broadcasters (NAEB). The NAEB urged that consideration be given to the findings and recommendations of a two-summer study, financed by the National Aeronautics and Space Administration, and conducted by the National Academy of Sciences and the National Research Council. The JCET joins in urging that the recommendation's of the NAS-NRC study, particularly those of Panel 10 on Broadcasting, be heeded.

4. In its recommendations, Panel 10 noted:

- 2 -

Because the availability of frequency spectrum may pace the whole field of broadcast-satellite applications, and considering the long development and coordination lead times, the Panel recommends immediate action by the FCC and the ITU in order to secure frequency assignments within the following bands for space broadcasting use:

108 MHz for FM direct broadcast.

470-89 MHz for direct-to-home broadcast (possibly restricted to the upper end of the band).

2500 MHz for ETV and other public TV services.

12.000 MHz for distribution service.

Allocations in the 18 GHz and 35 GHz bands which may have important future uses.

5. The JCET recognizes that the allocation of frequencies for space-to-earth broadcasting is no substitute for the provision of adequate frequencies for earth-to-space transmissions. While some two-way educational communications, such as voice or digital response to instructional programs, might be accommodated within the space-to-earth assignments (<u>cf. Instructional Television Fixed Stations</u> (D. 18346), 18 RR 2d 1617), in the main, we envision that up-links for space-borne educational transmissions will use bands, such as 6 GHz, which are already allocated or will be allocated for earth-to-space communications and that noncommercial users might, indeed, make use of common carrier services for up-link transmission in lieu of constructing their own systems.

6. In this submission, the JCET wishes to speak with particular emphasis upon the pressing need to make the first and third NAS-NRC recommendations priority items in the United States position: Allocation of 108 MHz for direct FM broadcast, and the reservation of the 2500-2690 MHz band for ETV, public TV services, and other educational and noncommercial communications coequally for space and terrestrial transmissions.

7. The current Preliminary Views would, via proposed Footnote 268A, permit space-borne FM aural broadcasting in the 88-100 MHz band "subject to agreement among the Administrations concerned ..." While the JCET supports the footnote proposal, it notes that objection has already been raised by the Hawaiian Telephone Company, and that thus far, little support has been evidenced.

8. The JCET recognizes that effecting the prerequisite international agreements to make the use of space-borne aural services in the 88-100 MHz band would, at best, be a long and complex task, and that the political constraints may effectively preclude any near-term hope that aural space broadcasting can be initiated. The fact that the 88-100 is a commonly-assigned band for aural FM service terrestrially is, in fact, a two-edged sword. On the one hand, it offers the possibility of space transmission to many existing receivers. On the other, the fact that terrestrial FM is already established, and quite well-developed in the United States, is a strong counterforce, working against the sought-after goal.

9. Even if "agreement among the Administrations concerned" were accomplished, use of any frequency in the 88-100 MHz band on a shared basis with terrestrial facilities would require reassignments of existing terrestrial FM stations to create one or more clear channels for space FM or, since FM receivers accept the stronger of two signals and reject the weaker, a space-borne FM

- 4 -

signal would be subject to "holes" in its coverage in each market in which a terrestrial FM station operated at the same or an adjacent frequency.

10. The result would be that space-borne FM radio would have to be a predominantly -- perhaps exclusively -- rural service, and that the substantial majority of FM sets and FM set owners in the United States would not be able to benefit from such a service.

11. The exclusive allocation of 108 MHz would provide most of the benefits and have few of the drawbacks of the proposed footnote. 108 MHz is close enough to the terrestrial FM broadcast band to be tuned by conventional receivers in the hands of the general public. In this country, it has already been used for space transmissions in the "Vanguard" program, and was adopted by the Special Committee for the International Geophysical Year (IGY) (1956-1959). Terrestrially, it is assigned by the Commission to VOR test stations on the condition that harmful interference is not caused to the reception of FM broadcasting stations, present or future. Clearly, minimal relocation problems would be incurred by the assignment of 108 MHz to aural space transmissions, and the advantages of frequency assignment within the capability of conventional receivers would be preserved.

12. National Public Radio, the newest Constituent Member of the JCET, is particularly concerned with the expanded potentials for national service which are offered by space-borne FM radio. NPR has been created with the assistance of the Corporation for Public Broadcasting to respond to the Congressional mandate of the Public

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Broadcasting Act of 1967 to make widely available to the American people the benefits of noncommercial radio, as well as noncommercial television.

13. Public radio is not now equally available to the citizens of the United States. Most noncommercial radio stations serving a broad general audience are located in the Northeast quandrant of the U.S., in the Upper Midwest around the Great Lakes, and along the Pacific Coast. The "white areas" in which no noncommercial public radio is available are extensive. To serve the American public consistent with the mandate of the Public Broadcasting Act of 1967 will require the expansion of public radio service to serve all of the American public. Since terrestrial AM frequencies are not generally available, and the construction of new FM networks expensive in terms of both time and money, National Public Radio is interested in the ways in which communications satellite technology might be employed to help in discharging its Congressionallymandated responsibility. Aural FM broadcasting by satellite appears to offer a means both of increasing the service to existing noncommercial ground-based FM stations and of reaching new audiences in presently unserved areas. For the first time in the nation's history, the mandate, the technology, and the funds appear to be available to make of noncommercial radio a true national service, equally available to all our citizens.

14. The JCET is equally interested in urging that education's present status in reference to the band 2500-2690 MHz be preserved in space transmission as it is terrestrially. The Sixth Notice of Inquiry currently indicates that "a proposal to use

- 6 -

satellites within the band 2500-2690 MHz in conjunction with the instructional television fized service (ITFS) is under study."

15. A proposal has been put before the National Aeronautics and Space Administration by Eughes Aircraft for such an experiment on ATS-F or G. Both the technology and education's interest in satellite communications are already evident. The reasons for preserving education's options in the satellite use of this band are threefold:

16. As a NAS-NRC panel indicates and the Hughes Aircraft proposal demonstrates, satellite television service is possible at this frequency into ground terminals of modest cost. While the antennas and frequency convertors needed appear too expensive for direct TV broadcasting, they do appear to be within the financial reach of school systems, hospitals, and -- where geographic isolation requires -- even for individual schoolhouses.

17. Secondly, the existence of the Hughes proposal documents the fact that such transmissions are within the current state of the art. If the proposal is accepted by NASA, it will provide the educational community opportunities to gain firsthand acquaintance with the educational application of communications satellites.

18. Thirdly, there is much advantage to be gained by the extension of education's present status in relation to these frequencies to space as well as terrestrial transmissions. Not only might the technical problems of ground and space frequency-sharing be reduced, but the opportunities for mutual accommodation are far greater within education's common community of interest. The support

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iron government and foundations which will be required to initiate satellite usage might be extended as well to support of modification of terrestrial IFTS systems to minimize interference. The 2500-2690 spectrum presents a unique opportunity for rational systems design in which both terrestrial and space users might work together synergistically to optimize spectrum use.

19. Finally, the state-of-the-art capability for effective beam-shaping techniques, such as proposed in the Hughes submission to NASA, indicate that allocation of the 2500-2690 MHz band to educational communications from space can be made and that such transmissions can be undertaken within the boundaries of a single nation without causing interference to neighboring administrations.

20. While the 2500-2690 band is primarily used in this country by the educational community for instructional television fixed services, the JCET urges that the band be available for space transmission of all types of educational and public service communications. The potential applications of satellite communications should not be limited to instructional television but should encompase as well the possibilities of computer communications, facsimile transmission, audio services and the like.

21. National Public Radio has expressed interest in the possibilities which multiple audio channels in this band might offer for inter-city relay among public radio stations. It appears technically and economically feasible to provide multiple channels of high quality stereo via satellite which would allow each public radio station affiliated with NPR to choose among several network program services for retransmission to its local listening audience.

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22: Other non-television services might provide substantial benefits in a wide variety of professional educational and manpower development activities. The experience of Albany Medical College, which uses a communication of SCA transmission and previously distributed slides to conduct medical seminars, might be widely extended via communication satellites.

23. Other applications of educational communications ought likewise to be encouraged. Satellites could and frequency should permit the extension of Stanford University's computer-based elementary school mathematics to remote schoolhouses in Alaska or Appalachia.

24. The FCC's recent actions in Docket 18345, in regard to terrestrial ITFS clearly point the way toward more flexible and more useful applications in educational telecommunications. The Commission's foresight in authorizing, first, voice response and, later, other types of student response point clearly toward new and useful directions for the 2500-2690 band on the ground as well as in space.

25. Finally to be considered are the interest and ability of the educational and public service community in making use of the opportunities which such frequency allocations will provide. Since its <u>National Conference on Telecommunications Policy and Education</u>, in December, 1969, the JCET has been calling attention to the fact that satellite communications for noncommercial purposes is not some far-off dream, but a near-term possibility. Events subsequent to that conference have well demonstrated the interest of the noncommercial community, and its ability to respond to opportunities

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to capitalize upon satellite communications as such opportunities become available.

26. This nation's first domestic broadcast television satellite relay between two points within the Continental United States was the coverage of an address by the President of the Corporation for Public Broadcasting. That pioneering TV broadcast was one part of an experiment in transcontinental TV relay via Applicatious Technology Satellite III, and that transcontinental experiment is, in turn, the first of a series of experiments and demonstrations proposed to NASA by the Satellite Task Force of which the Corporation for Public Broadcasting, the Ford Foundation, the JCET, the National Association of Educational Broadcasters, and National Educational Television are members. With the continued cooperation of the National Aeronautics and Space Administration, the members of the Satellite Task Force expect to continue to demonstrate the importance to public service communications of satellite technology.

27. Only last night (April 28, 1970), the nation's first domestic relay by satellite of a radio broadcast was made, again by noncommercial broadcasters. A program originated by station KUAC (FM) at the University of Alaska was carried "live" by public radio station KQED-FM, San Francisco. The program was transmitted via a VHF ground station at the University of Alaska to ATS-I, received at a ground terminal at Stanford University, and sent by common carrier lines to KQED-FM for simultaneous broadcast. This pioneer radio broadcast was initiated by the Alaska Educational

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Broadcasting Commission as a part of an experiment and demonstration of the public service use of satellite communications proposed to NASA by the State of Alaska.

28. The Lister Hill National Center for Biomedical Communications of the National Library of Medicine, NIH, has taken a leading role in the use of satellite communications for the continuing education of health science specialists, remote processing of health information, and in the improvement of the nation's health services. LAUNCEC has worked actively with the University of Wisconsin, Stanford University, the State of Alaska and others in the public service-educational community who have made pioneering efforts in this field.

29. The evidence is overwhelming that education, public broadcasting, and other noncommercial user groups are more than passively interested in satellite communications. Members of this community have, indeed, been providing leadership in the application of satellite communications.

30. As experience to date already indicates, and as the use of the VHF capacities of ATS-I and III demonstrate, fullest benefit to the nation will require more than "crumbs-from-the-table" provisions for noncommercial users within the context of the needs of commercial carriers. As the JCET said in its submission to the White House study group on domestic satellites:

> We believe that noncommercial applications require special study within their own frame of reference. Their technical requirements, as well as their public benafits, may differ markedly. For example, television transmission to low-cost community center ground terminal. (as in ATS-F) may be neither attractive nor desirable within the commercial

- 11 -

context, but might offer substantial public benefit in noncommercial applications. The NAS panel at Woods Hole has pointed out that such service could have great value, not only in areas of this country lacking in infrastructure, but also in serving such special needs as those of the medical profession, even where terrestrial facilities are plentiful.

In computer communications, some have indicated that the growing number of computers is likely to so diminish teleprocessing costs that satellites will have little impact. (The GE filing in Docket 16495 appears to indicate a contrary view.) What is true for the use of computers by business and industry may not, however, apply to such educational applications as computer-assisted instruction, inter-university research, and the like. At prement, there seems substantial evidence that interconnection costs are a major constraint to the expansion of CAI, and that satellite communications might be most useful.

In short, noncommercial needs may not be congruent with requirements of a commercial service. The dedication of "free channels for educational and instructional television," offered by Comsat in its Pilot Proposal, while unquestionably desirable, may not, alone, be adequate to the task of reali ing the full benefits which noncommercial satellite services could offer.

Wherefore, for all of the foregoing reasons, JCET urges the Commission to take active steps to preserve education's options in space by allocating frequencies for exclusive educational use in accordance with the above recommendations.

Respectfully submitted,

By:/s/ Robert A. Woods

JOINT COUNCIL ON EDUCATIONAL TELECOMMUNICATIONS

By: /s/ Norman E. Jorgensen By:/s/ Louis Schwartz

Pint Chillicher

Krieger & Jorgensen 1926 Eye Street, N. W. Washington, D.C. 20006

Its Attorneys

April 29, 1970.

FEDERAL COMMUNICATIONS COMMISSION Washington, D. C. 20554

In the Matter of

An Inquiry relating to preparation for a World Administrative Radio Conference of the International Telecommunication Union on matters pertaining to the radio astronomy and space services.

DOCKET NO. 18294

Before the Commission:

REPLY COMMENTS OF THE JOINT COUNCIL ON EDUCATIONAL TELECOMMUNICATIONS

Comes now the Joint Council on Educational Telecommunications (JCET), and through its attorneys, files its reply comments with respect to the SIXTH NOTICE OF INQUIRY in the above-referenced proceeding.

1. The JCET is a consortium of national and regional nonprofit educational organizations. Its Constituent Members are:

> American Association on Higher Education American Association of Junior Colleges American Association of School Administrators American Council on Education Corporation for Public Broadcasting Council of Chief State School Officers Department of Audiovisual Instruction, NEA Interuniversity Communications Council (EDUCOM) Great Plains Instructional Television Library Institute for Development of Educational Activities (I/B/E/A) National Association of Educational Broadcasters National Association of State Universities and Land-Grant Colleges

National Catholic Educational Association National Instructional Television Center National Public Radio

Its Associate Members are:

Southern Educational Communications Association Indiana Higher Education Telecommunications System Western Educational Society for Telecommunications.

2. The JCET has reviewed the comments filed in this pro-

ceeding with respect to this Notice, and is pleased to note that its

own concerns are widely shared. Our review of the comments filed reveals no opposition to the positions urged by the JCET and considerable support for our proposals.

3. Those organizations directly concerned with noncommercial radio have all supported the proposal that 108 mhz be allocated for noncommercial space-borne FM aural broadcast. In our own comments, we expressed the particular interest of National Public Radio, the JCET's newest constituent member. Other JCET members have, in their own filings, expressed their interest and support. In particular, the National Association of Educational Broadcasters, in paragraph 12 of its filing, and the Corporation for Public Broadcasting, in paragraph 3 of its submission, join in support of the need for this channel for direct FM aural transmission.

4. It must be noted that the principal respondents, the Corporation for Public Broadcasting, the National Association of Educational Broadcasters (including its radio division, National Educational Radio), and the JCET (including National Public Radio) represent all of the major interests in noncommercial educational radio in the United States.

5. In the matter of the allocation of 2500 - 2690 mhz for noncommercial communications from space, support is widespread. The State Department of Education of the University of the State of New York speaks forcefully to the need for instructional television by satellite transmission as well as terrestrially-based transmission. In letters to the Commission, California State Superintendent of Schools, Max Rafferty, and Mrs. Betty Noel, consultant to the California State Department of Education, speak forcefully to the need for instructional television service, as does Dr. Charles Vento.

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6. In reply comments to be filed by the National Education Association, NEA indicates the interest of its more than one million members in the broad potential benefits which space communication offers for improvement of public education. Further, the NEA submission documents education's genuine interest by the description of a proposed experiment in satullite communications which NEA plans to submit to the National Aeronautics and Space Administration.

7. Mr. Joseph A. Beirne, President of the Communications Workers of America, points out in his submission the desirability of making the 2500 - 2690 mhz band available "for broad educational purposes," as do several other parties which have submitted comments. The Corporation for Public Broadcasting focuses upon the potential which this spectrum could make available for flexible communications networks. The NAEB and the JCET likewise point out the possibility of satellite distribution to interconnect noncommercial radio and television stations, ITFS systems, hospitals and health centers, universities and schools.

8. Dr. James E. Allen, Assistant Secretary for Education and U. S. Commissioner of Education, well documents some of the uses to which electronic communications are already being put in the public interest and which might be extended through the application of satellite technology.

9. Dr. Ruth M. Davis, Director, Lister Hill National Center for Biomedical Communications, indicates the importance of satellite communications in the health sciences, and again offers evidence that the educational and public service community is already pioneering in the application of satellite communication to the public good.

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10. The following news release from the U. S. Department of Health, Education, and Welfare describes experiments already in progress:

> Dr. Ruth M. Davis, Director, Lister Hill National Center for Biomedical Communications, National Library of Medicine, announced today that experimental satellite communications were recently established between the University of Alaska in Fairbanks, the University of Wisconsin, Stanford University, and the Lister Hill Center at the National Library of Medicine in Bethesda, Maryland. This was the first group communication via satellite between four medical centers.

> The purpose of the experimental series of voice communications was to demonstrate the potential of satellite communication in assisting practicing physicians in remote areas. The equipment used by the Lister Hill Center was inexpensive and easy to install. For example, it costs less than ham radios currently being used by health aides in the villages of Alaska. The transceiver loaned to the Lister Hill Center for Biomedical Communications by NASA costs about \$700. The antenna costs \$78.00.

> Other tests in the planned series include EKG transmission, information data transfer between medical institutions and slow scan television transmission. A future experiment would involve transmission of color photo facsimile between Stanford University and the Lister Hill Center. In the full series of experiments, most of the equipment will be on loan to the Center by Litton Industries, General Electric Company, and NASA.

11. The comments of the Satellite Telecommunications Subdivision, Industrial Electronics Division, Electronics Industries Association, also have relevance to the concerns of the educational community. In Paragraph 10 of the EIA/SAT submission, it is noted that the Commission itself has indicated that "there are a number of bands at 2 ghz that are lightly used at this time and that they could be available for small satellite service users in remote areas." Like EIA/SAT, we do not agree with the Commission that "the requirement is

- 4 -

so poorly defined as to eliminate the need for proposals." We believe the JCET's recommendations regarding the 2500 - 2690 band are consistent with EIA/SAT's suggested allocation of 2110 - 2200 mhz for remote area satellite communications, and that both suggestions are evidence that there is more active interest in such applications than the Commission may previously have been aware of.

12. JCET shares with the EIA/SAT and with others who have filed comments in this proceeding, the belief that the NAS study represents an investigation of space broadcasting which is both thorough and significant. We agree with EIA/SAT's comment that "recommendations which are in line with those of the NAS deserve more weight than those which appear to be based on a less comprehensive analysis."

13. Like EIA/SAT and COMSAT, we also find reason to feel concern regarding the proposed redefinition of the broadcast satellite service as modified by proposed Footnote 84 AP.1. With EIA/SAT, we consider that steps should be taken to clarify definitions "in matters relating to the broadcast service, the educational service, and the instructional service." We note COMSAT's comment that "the national and international CCIR proceedings from which the modifications have been taken seem to reflect both a division of opinion and an absence of focus on this important point."

14. Be that as it may, our prime concern is with the confusion which must inevitably result from the inclusion of "community reception" within the definition of "direct reception" from which it greatly differs, in technology, in near-term availability, and in considerations of policy. Direct TV broadcast satellites, the Commission notes, raise technical problems which may not be solved for

- 5 -

15 years. The thorny policy problems, many raised in comments submitted in the instant proceeding, may take even longer to resolve if, indeed, they ever are. Distribution satellites, suitable for "community reception" of television will be operational in the immediate future, with the implementation of the Indian experiment on NASA's ATS-F.

15. An educational communications satellite operating in the 2500-2590 mhz band could provide a wide variety of services, including the transmission of instructional television programming to: (a) public television stations for rebroadcast; (b) the ITFS systems of urban school systems for retransmission to classrooms; (c) university campuses for distribution to campus buildings (including the Campus Laboratory School); and (d) in remote rural areas where neither public TV station, ITFS system, nor university campus exist -- directly to inexpansive ground terminals on the roofs of the school houses.

16. To label such a satellite service as "direct reception", as Note 84 AP.1 would do, is to place upon it the heavy burden of argument against the authorization of commercial direct TV brondcast satellites. Thus, the Indian experiment, scheduled for the ATS-F, is tarred with the same brush used against some future hypothetical "home entertainment center in the sky" which might -- at least in theory -- broadcast commercials, foreign propaganda, and the like, directly into every pair of "rabbit ears" and so undermine commercial networks and local stations as we now know them in this country. We believe that the two services are vastly different in every significant way, that the prospect of improving learning in the oneroom school house should not wait upon the far-off solution to complex technical, legal, and ethical problems which will long plague true "direct reception."

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17. We cannot summarize better than by quoting the words of Dr. James E. Allen, Jr., Assistant Secretary for Education and U.S. Commissioner of Education, who writes, in USOE's comments in this proceeding:

> Space transmission from satellites can make available, to those who most need them, economic, communication-based educational services. These services are very much in the public interest and fit into long-rango plans of the Office of Education. They also allow natural extensions of services which have already been shown to be educationally beneficial, using terrestrial communications systems. Therefore, in the interest of the general public and in the light of the role that telecommunications can have in solving some of the major educational problems of this Nation, the United States Office of Education strongly urges that adequate spectrum resources be made available for educational services of all types, including television, radio, telephone, facsimile, computer-data, and others, limited only by the educational needs of the country.

> > Respectfully submitted,

JOINT COUNCIL ON EDUCATIONAL TELECOMMUNICATIONS

Norman E. Jorgensen By:

By: Louis Schwartz

By: Robert A. Woods

KRIEGER & JORGENSEN 1926 Eye Street, N.W. Washington, D.C. 20006 337-6313 Tel. No.

Its Attorneys

STATEMENT OF JOHN W. MACY, JR. BEFORE THE FEDERAL COMMUNICATIONS COMMISSION TUESDAY, MAY 19, 1970 IN DOCKET NO. 18294

Chairman Burch, Commissioners: I am John W. Macy, Jr., President of the Corporation for Public Broadcasting. Today I am also appearing as a member of the board of the Joint Council on Educational Telecommunications to present the combined views of the Joint Council, the National Association of Educational Broadcasters, the Alaska Educational Broadcasting Commission and the New York State Department of Education, as well as the Corporation for Public Broadcasting. Also accompanying me are Mr. Donald R. Quayle and Mr. Walter R. Hinchman.

On February 18th of this year I had the pleasure of participating in the first satellite transmission of a live television broadcast between two points in the United States. The program originated in Columbia, South Carolina, was fed to NASA's ground station at Rosman, North Carolina, and then to the ATS-III communications satellite 22,300 miles above the equator. The program was relayed from the satellite to a ground station in Mojave, California, and then sent by land lines to be broadcast over public television station KCET in Los Angeles. At that time I stated that "the distance between the moon and earth is far greater than between Columbia and Los Angeles, but the distance between many of the people of our nation is greater still."

We have only begun to glimpse the possibilities offered by the use of satellites for communications. However, we already know that this new communications tool offers the opportunity to lessen that gap between Americans and ultimately to span similar gaps between all the peoples of the world. Public broadcasting, together with the educational community in the United States, has a unique commitment toward this goal. This is why we are here before you today to press our case for the allocation of the 2500 to 2690 MHz band for the exclusive use of noncommercial educational interests and for the utilization of 108 MHz for public FM radio transmission.

THE COMMITMENT OF PUBLIC BROADCASTING AND EDUCATION TO SATELLITE COMMUNICATIONS

As the Commission knows, the Corporation for Public Broadcasting was contemplated by Congress as a means of bringing private and public efforts together to achieve the expansion and development of noncommercial educational broadcasting. Toward this end, the Congress directed the Corporation to "assist in the establishment and development of one or more systems of interconnection to be used for

-2-

the distribution of educational television or radio programs." With the support of the Commission, the Corporation has been striving to work out a satisfactory system of terrestrial interconnection.

But the eyes of educational broadcasters have also been on the stars. In June of 1969, the Satellite Task Force for Public Broadcasting -- consisting of the Corporation, The Ford Foundation, NET, the NAEB and the JCET--proposed a full scale experiment to the National Aeronautics and Space Administration in the use of satellites to transmit television programs domestically. NASA enthusiastically endorsed this proposal and the experiment was conducted during January through March of this year. During this three-month period public broadcasting's entire evening program schedule was transmitted via satellite from Rosman, North Carolina, through Mojave, California, to KCET in Los Angeles for purposes of comparing the quality of service between satellite and terrestrial systems. As a result we in public broadcasting are not only the first to transmit domestic television broadcasts by satellite but we have also learned much about the technical problems of satellites and the cost of their operation.

This experiment was a giant step for broadcasting in the United States, but it is only a first step. The state of Alaska is now also combining with NASA to utilize

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ATS-I during the coming year for the experimental satellite transmission of instructional and public radio and television broadcasts to remote areas of that state and other locations in the continental United States. On April 28, 1970, the nation's first domestic relay by satellite of a radio broadcast was made under this experiment. Educators and public broadcasters in the United States have truly established themselves as princers in domestic satellite utilization.

In addition, on March 18, 1970, the Governor of Alaska, Keith Miller, wrote to NASA and requested that audio and video experimentation in Alaska's rural areas be included in the program for NASA's ATS-G satellite. The specific requests were the following:

> Some provision for TV transmission to small, low cost, unmanned earth terminals in Alaska's rural areas. Such a capability would allow the testing of earth terminals and satellite capability under the most adverse conditions.

> > -4-

Some provision for semi-direct FM audio transmission for educational radio networking. Alaska's present experimentation with the VHF segment of the ATS-1 demonstration is leading it to believe that such capability could be of great benefit, particularly if the frequencies used were more accessible to educational broadcasting. Educational radio, not only in Alaska, but also nationwide, could benefit from this experimentation.

THE POTENTIAL OF SATELLITE COMMUNICATIONS FOR EDUCATION AND PUBLIC BROADCASTING

2.

Comments and reply comments were filed in response to the Sixth Notice of Inquiry by a host of educational and public broadcasting representatives, including the U.S. Office of Education, the State Departments of Education of California and New York, the Lister Hill National Center, the JCET, the NAEB, the National Education Association and the Corporation for Public Broadcasting. As these filings demonstrate in detail, the educational uses for satellite communications are virtually limitless. Educators and public broadcasters in the United States are ready, willing

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and able to seize this opportunity and to work together so that through this technology our people can be stimulated and enlightened. Through the use of satellites we can bring instructional materials to more remote places, we can link people together and they can begin to talk with one another.

The New York State Department of Education in its Comments speaks clearly to the need to extend Instructional Television Fixed Service via space communications to deliver instructional programming to remote areas and to capitalize upon the potential which space technology offers for more equitable sharing of the nation's teaching and educational resources.

While Instructional Television Fixed Service has been the primary occupant of the 2500-2690 MHz band, the Joint Council urges that the band be available for space transmission of <u>all</u> types of educational and public service communications. The potential benefits of satellite communication are not limited to instructional television, but encompass well the possibilities of computer communications. facsimile transmission, audio service and the like. Medical seminars such as are now underway in the Pacific northwest could be vastly extended via satellite communications. Likewise, Stanford University's computer-based elementary school mathematics program, now transmitted by conventional

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land lines to Kentucky, Pennsylvania, and Mississippi, • could be made available as well to the remote schoolhouses of Alaska and Appalachia.

The National Association of Educational Broadcasters properly suggests that terrestrial ITFS should be broadly redefined to permit a wide variety of electronic communi-

cations for instructional and educational purposes. Recent rulings by the Commission permitting the use of voice and digital student response to instructional television programming are clearly a step in this direction.

As Mr. Charles M. Northrip, Executive Director of the Alaska Educational Broadcasting Commission, points out:

> Alaska's large land area, severe climate, and sparse population demand that communication be accomplished with minimum terrestrial facilities. Problems of access for maintenance and installation, power availability, and limited financial support in the rural areas argue against on-theground solutions to the State's communication problems.

The newly created National Public Radio has expressed interest in the potential of satellite communications for linking public radio stations with multiple channels of high quality stereo. Such a system would allow a public radio station to choose from among several simultaneous network offerings that programming most responsive to the needs of its own local audience.

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The Public Broadcasting Act contemplates that local noncommercial stations should play a major role in the public broadcasting system. For example, the Act encourages the use of local stations for the production and origination of national programming, thereby strengthening the concept of diversity of national program sources. Thus, under the ideal system of interconnection, quality programming of national interest will flow into the system from various cities such as Dallas, Phoenix, San Francisco, Denver, Seattle and Columbus, as well as the traditional centers of broadcasting.

The Act further envisions the establishment of multiple channels of interconnection so that stations will be free to make a choice from a variety of program offerings. Congress has also endorsed public broadcasting's system of regional and state networks which enables stations to carry programs of particular local interest which would

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not otherwise be available.

Achieving the highly flexible and sophisticated interconnection system that Congress contemplated for public broadcasting would be difficult and expensive using terrestrial lines alone. However, such a system is altogether possible with satellite facilities. The multiple channel capability, the ability to originate at will from numerous earth stations, together with low cost of ground stations and the generally lower operating costs, would greatly enhance the ability of public broadcasting to achieve the goals set by Congress. It would allow for the establishment of a flexible method of networking among radio and television stations throughout the country, would enhance the development of regional and state networks, and would greatly increase the number of program choices available to stations. Multiple origination points would become more feasible in public affairs and news programming and transmission from remote locations by means of portable earth stations would be possible for the first time.

The 2500-2690 MHz band could provide a wide variety of services, including the transmission of television programming to (a) public television stations; (b) the ITFS systems of urban school systems; (c) university campuses; and (d) to remote areas where neither public

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TV station, ITFS system, nor university campus exist.

WHY THE EXCLUSIVE ALLOCATION OF THE 2500-2690 MHZ BAND FOR NONCOMMERCIAL AND EDUCATIONAL USE

There are four basic reasons why we seek the exclusive allocation of the 2500-2690 MHz band for noncommercial and educational use for both space and terrestrial applications.

<u>First</u>: It appears that this portion of the spectrum can be utilized with the greatest ease, economy and flexibility.

The 2500-2690 MHz range possesses several distinct advantages over any other for educational and noncommercial uses:

- It is low enough in the radio spectrum that low cost, efficient, and reliable equipment is easily built; in fact, much of the needed technology is already available for both space and earth segments.

- Technical criteria for sharing between space and terrestrial services are easier to formulate, since both services employ fixed, wide-band transmission facilities with highly directive antennas.

- Nontechnical sharing arrangements will be more easily established, since in most instances the same entity or community of interest will be involved in both services.

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- The educational community already has much familiarity with the particular propogation and equipment characteristics of this range, thus no major retraining would be needed.

Education in the United States as well as other countries is largely publicly supported. Educational broadcasting has been particularly hampered by a lack of sufficient funding. It was this very problem which the Carnegie Commission sought to eliminate for public broadcasting by its recommendation that the Corporation be established and provided with substantial, insulated Federal funds.

It is clear, however, that even with the infusion of substantial Government funds for education and for public broadcasting, these interests will never become wealthy members of the communications community. Congress, by providing for free or reduced interconnection rates, clearly recognized the continuing financial needs of educational broadcasting. In these circumstances the public interest is best served by insuring that education

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and public broadcasting have access to that portion of the satellite spectrum which will enable it to operate most effectively at the lowest possible cost. Such action will result in the fullest and more proper use of the public funds available to education and public broadcasting interests.

Second: The exclusive allocation of the 2500-2690 MHz band for noncommercial educational satellite use is the logical extension of the present use of this band in the United States, since this portion of the spectrum is now used by ITFS systems on a virtually exclusive basis. Combining this terrestial use with satellite uses of the same nature is entirely feasible. Actually, it would minimize the technical problems of terrestrial and space frequency-sharing and would provide an opportunity for the design of a system allowing optimum spectrum utilization. To allow noneducational users to compete for space in this band might seriously jeopardize the further growth of ITFS systems. Like other aspects of educational broadcasting, ITFS has had a slow development, but are firmly convinced of the tremendous value of these systems for educational and public purpose. Every possible effort should be made to increase the development of ITFS.

Third: The United States has a clearly established policy of reserving spectrum space for educational purposes.

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Without the specific reservation of FM and television frequencies for exclusive educational use, educational broadcasting operations in many areas of the country would now be foreclosed or seriously hampered. This policy of exclusive allocation and reservation which recognizes the great public interest value of educational communications, is equally appropriate in the now developing area of satellite communcations. Educators and public broadcasters will move vigorously to utilize this satellite technology, but its full potential can be realized only if this portion of the spectrum is protected from other uses.

<u>Fourth</u>: The 2500-2690 MHz band also has tremendous potențial for other countries. The factors of expense, flexibility and protection which favor the exclusive availability of this portion of the spectrum for educational purposes in the United States are equally applicable in other nations and even more relevant to less-developed countries.

WHY 108 MHz FOR NONCOMMERCIAL FM RADIO TRANSMISSION FROM SPACE

The Commission has proposed that the American position should be that the 83-100 MHz band be available on a "footnote" basis to permit direct FM broadcasting if approved by all of the affected nations. It has been pointed out by

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several of the comments filed in response to the Sixth Notice of Inquiry that such agreement appears unlikely in this hemisphere and that because the FM band is well utilized in this country, such service, even if permitted, would be useful only in rural areas because of the high degree of interference potentiality within the 88-100 MHz band.

We agree that FM radio broadcasting from satellites for regular commercial service is unlikely to prove attractive in the U.S. for the reasons noted. On the other hand, there is a distinct possibility that this capability may be utilized to a limited extent for interconnecting public radio stations and for reaching remote listeners to provide instructional services, news of major national events, natural disaster warnings, etc.

We believe, therefore, that it would be more reasonable for the Commission to support the exclusive allocation of 108 MHz for public FM radio transmission from space.

The potential for national service which is offered by FM broadcasting's use of satellites has recently been enhanced by the creation of National Public Radio, which is an organization established with the assistance of the Corporation to respond to the Congressional mandate to make available to the American people the benefits of noncommercial radio as well as television.

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Public radio is not now equally available to the people of the United States. Most noncommercial radio stations serving broad general audiences are located in the northeast, the upper midwest and the Pacific Coast. Since terrestrial AM frequencies are not generally available, and the construction of new FM networks is expensive in terms of both time and money, National

Public Radio is vitally interested in the employment of satellite technology. FM broadcasting by satellite appears to offer a means both of increasing the service to existing noncommercial FM stations and of reaching new audiences in presently unserved areas. For the first time in the nation's history, the mandate, the technology, and the funds are available to make noncommercial radio a true national service, equally available to all our citizens.

CONCLUSION

In concluding these specific recommendations, I would like to emphasize our view that the Industry-Government group to be formed by the Department of State should include representation of education and public broadcasting interests. The Corporation is prepared to support such representation. I fully agree with the Commission's statement inparagraph 66 of the Sixth Notice of Inquiry that oral presentation of views is not a substitute for participation in that group. Such representation is required not only to advance the specific positions that educators and public broadcasters have taken in this proceeding, but also to insure that the great potential of satellite communication for educational and public purposes will be fully considered in all appropriate aspects of the group's work.

Thank you very much for giving me this opportunity to appear before you. If you have any questions, we will attempt to answer them.