THE WHITE HOUSE

WASHINGTON

Original letters in Dornsat file

October 9, 1969

MEMORANDUM FOR

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

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

Clay T. Whitehead
Chairman

1 Atch

X Leonard H. Goldenson
President
American Broadcasting Companies, Inc.
1330 Avenue of the Americas
New York, N. Y. 10019

X Julian Goodman
President
National Broadcasting Company, Inc.
Thirty Rockefeller Plaza
New York, N. Y. 10020

X J. R. McNitt (James)
ITT World Communications, Inc.
President
67 Broad Street
New York, N. y. 10004

X Charles J. Wyly, Jr.
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University Computing Company
1300 Frito-Lay Tower
Dallas, Texas 75235

X Joseph A. Beirne
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1925 K Street, N. W.
Washington, D. C. 20006

X George D. Butler
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Electronic Industries Association
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Washington, D. C. 20006

X Richard D. DeLauer
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TRW Systems Group, TRW Inc.
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Redondo Beach, California 90278

X S. G. Lutz
Chief Scientist
Hughes Research Laboratories
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X T. Vincent Learson (President - ?)
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X James J. Clerkin, Jr.
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General Telephone & Electronics
Corporation
730 Third Avenue
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X Earl D. Hilburn
Executive Vice President
Western Union
60 Hudson Street
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X Joseph V. Charyk
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950 L'Enfant Plaza South, S. W.
Washington, D. C. 20024

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

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Washington, D. C. 20036

J. D. O'Connell
Director
Office of Telecommunications Management
Executive Office of the President
Washington, D. C. 20504

Howard R. Hawkins
President
X RCA Global Communications, Inc.
60 Broad Street
New York. N.Y. 10004

Edward B. Crosland
Vice President
X American Telephone and Telegraph Co.
195 Broadway
New York, N. Y. 10007

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

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

E. A. Gallagher
X President
Western Union International, Inc.
26 Broadway
New York, N.Y. 10004

Frank Stanton
X President
Columbia Broadcasting System, Inc.
51 West 52 Street
New York, N.Y. 10019

The Ford Foundation
McGeorge Bundy
X President
320 East 43rd Street
New York, N. Y. 10017

Richard S. Mann
President
The RME Group of Communocations Companies
100 East Broad Street (Suite 1302)
Columbus, Ohio 43215

M. G. Robertson
President
Christian Broadcasting Network, Inc.
P. O. Box 111
1318 Spratley Street
Portsmouth, Va. 23705

National Cable Television Association Inc.
X Frederick W. Ford
President
1634 Eye Street, N. W.
Washington, D.C. 20006

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

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

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

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

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

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

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

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

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

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

Mr. John W. Macy, Jr.
President
Corporation for Public Broadcasting
1250 Connecticut Avenue, N. W.
Washington, D. C. 20036

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

Mr. Fred J. Borch
Chairman of the Board and Chief Executive Officer
General Electric Company
570 Lexington Avenue
New York, New York 10022

9/16 ltr fm. L. B. Davis, V. P., GE, 777 14th St., Wash. D. C.

Mr. T. Vincent Learson
President
International Business Machines Corporation
Old Orchard Road
Armonk, New York 10504

8/26 ltr advising they will try to cooperate as soon as possible
9/4 ltr of reply fm. Vincent Learson

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

Dr. R. D. DeLauer
President
TRW Systems
1 Space Park
Redondo Beach, California 90278

9/16/69 ltr responding to oursof 8/19

Mr. George Butler
President
Electronic Industries Association
2001 I Street, N. W.
Washington, D. C. 20006

9/19 ltr from John Gayer, Chairman Satellite Telecommunications Subdiv., Ind. Electronics Div., EIA

8/20 ltr advising they will be in touch shortly with inputs
9/5 ltr fm. S. G. Lutz, Chief Scientist, Hughes Research Laboratories, div. of Hughes Aircraft Company, 3011 Malibu Canyon Rd., Malibu, Calif.

Mr. Joseph A. Beirne
President
Communications Workers of America
1925 K Street, N. W.
Washington, D. C. 20006

9/17 ltr fm. Joseph A. Beirne, in reply to our letter of 8/19.

Mr. Charles H. Pillard
President
International Brotherhood of Electrical Workers
1200 15th Street, N. W.
Washington, D. C. 20005

Mr. Vincent T. Wasilewski
President
National Association of Broadcasters
1771 N Street, N. W.
Washington, D. C. 20036

Mr. Frederick W. Ford
President
National Cable Television Association, Inc.
1634 I Street, N. W.
Washington, D. C. 20006

8/26 ltr advising he would submi comments before 10/1

General James McNitt
President
International Telephone and Telegraph
World Communications
67 Broad Street
New York, New York 10004

9/19/69 ltr of reply

Mr. Howard Hawkins
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RCA Global Communications
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Mr. Edward A. Gallagher
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Dr. Frank Stanton
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9/19/69 - ltr replying to ours of 8/1

Mr. Leonard Goldenson
President
American Broadcasting Company
1330 Avenue of the Americas
New York, New York 10019

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

THE WHITE HOUSE

WASHINGTON

August 19, 1969

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

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

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

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

Sincerely yours,

Clay T. Whitehead
Staff Assistant

Enclosure

5/22/70

To: Central Files

From: Eva Daughtrey

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

EDaughtrey:jm

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September 19, 1969

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

RE: WHITE HOUSE STUDY OF DOMESTIC INTRACONTINENTAL DIRECT BROADCASTING SATELLITES, AND FCC FIFTH NOTICE OF INQUIRY (FCC DOCKET 18294) ON RECOMMENDATIONS TO (WARC) WORLD ADMINISTRATIVE RADIO CONFERENCE AND ITU.

Dear Sir:

1. As a follow-up on some preliminary comments of my letter of 8/4/69 (TAE080469LM1), on Domestic Intracontinental Direct Satellite Broadcasting from our U.S. Domestic Radio Spectrum Utilization and saturation point of view, I would now like to add some comments on FCC Docket 18294 for U.S. recommendations to WARC-ITU relative to some international intercontinental direct broadcasting satellite concerns. The attached TAE021866LM1A (marked Pars.), 021169, 030768, will show introduction and activity in this area of comment.

2. The attached comments on FCC Docket 18294, relative only to that portion of U.S. recommendations to assign satellite channels in our U.S. spectrum directly on existing terrestrial channels, my TAE090369LM1 seems self-explanatory in a good measure.

A. I feel that we must pay more systems analysis attention to coordinating the short and long time use of direct off-ground and broadcasting satellites.

B. For new developing countries, the direct off-ground broadcasting principle (incl. Satellites) may have potential, but,

C. For developed countries, where most of its spectrum channels are needed, the off-ground distribution sub-system is very undesirable, inconvenient, and very inefficient both spectrum channel wise and economically (as indicated and illustrated by "TAE021063LM, Air Vs Ground Base Broadcasting Utilization Illustrations" and Figs. 2 & 3 or TAE021169LM2BIA attached).

D. One of my thrusts is that we must make much better total and long time educational telecommunications systems analysis, to determine when and where to cut over from the inefficient off-ground application for underdeveloped countries (if we go that direction) to the more efficient ground based system for developed countries; otherwise the society can suffer great social and economic losses (severe channel interference pollution); a point so far completely ignored in most of the current deliberations in both government and civilian sectors, as far as I can see the picture. This now becomes of top importance because the Satellite coverage will embrace all countries whether desired by some or not!

E. Another thrust is that this sort of information must have much wider dissemination, because there are so many endeavors that can be effected by these directions; because time and directions are needed for social and educational planners, and because of the need

of a catalyst for greater collective participation and contribution by all sub-system country sectors, if we want to get the best and great potential of a better overall communications system. Communications can do for education and the society what technology and transportation did during the industrial revolution - if we but give it the chance of correct application to our needs and growth.

3. My interpretation is that the present Docket 18294 direction will be contrary to our U.S. national best interest, and also contrary to the longer time best interests of developing nations.

A. This is my reason for a thrust that we should not now recommend to WARC/ITU that direct satellite broadcast assignments be made on a large portion of U.S. broadcast channels. These comments do not apply to other than the civilian and civilian sector broadcasting sector in the off-ground mode of the space communications services.

4. I hope you may have time to consider these above referenced points in relation to future mass communications and Satellite directions. Thank you.

Yours very truly,

Lloyd P. Morris

Lloyd P. Morris
2947 North 78th Court
Elmwood Park, Illinois
60635

LPM:es

TAE090369LM1

September 3, 1969

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 Telecommunications Union on matters pertaining to the radio astronomy and space services.	Docket Number 18294

1. Comments of Lloyd P. Morris, 3947 North 78th Court, Elmwood Park, Illinois, 60635, on the matter of space communications services and direct domestic intracontinental broadcasting in particular, as related to a forthcoming WARC Conference in the above captioned proceeding.

A. This petitioner has been involved in both education, commercial and non-commercial communications and broadcasting systems from local to university level starting over 40 years ago, and public school board of education activity, from local to national level for 20 years; has long been a member of several engineering and educational, professional societies; And co-founder now member Executive Committee and Treasurer of a school board supported ETV project (voluntary) now grown (without Federal or Foundation help) to 48 teacher selected courses on 2 channels delivered for about 6¢/course/pupil/year to schools housing over 1/3 million pupils. Additional details on other activities are appended if there is further interest,

B, Oneparticular comment emphasis or thrust will be directed toward the usurpation and pre-emption feature, and spectrum inefficiencies, of the direct domestic off-ground mode or broadcasting satellite, as compared to the ground based mode of signal distribution; the need for a much more comprehensive overall systems analysis before decision making, and the further need for a wider dissemination of all sides of this emerging communications art consideration, and

C. A suggestion that in a well developed country the domestic intracontinental direct to home and school telecommunications broadcasting satellite should not be authorized except in perhaps a few percents of the frequency spectrum space, for the reason, one of several,

D. That this off-ground mode of distribution represents a very poor and inefficient utilization of spectrum space and intertime zone program scheduling, and that

E. In the near limit case in a well developed country when maximum frequency spectrum utilization is needed, is when this off-ground general satellite direct broadcast mode fails to do a good job,

F. However, there may be an extenuating special case circumstance where the direct broadcasting satellite might be helpful in spanning large sections of an undeveloped country where direct broadcasting satellites might be amortized out and the system later changed over to the ground-based system before the society needs all of its communication channels. (There are a number of subsystem details, such as multiple languages, multi-time zone coverage, etc., that can make this direction questionable). For developed countries and areas, as a flexibility and duty cycle factor, the ground-based system becomes the necessary mode of distribution.

G. It is suggested that we have not yet made a sufficiently careful total systems analysis to show all sides of the direct domestic broadcasting satellite in relation to its longer time implications..

2. I am suggesting that a more careful overall comprehensive communications systems analysis will show that the intercontinental telecommunications satellite is a good idea, but that the intracontinental domestic direct broadcasting satellite is a bad, inefficient, and undesirable direction for good utilization of the frequency spectrum. No objection is here intended toward certain commercial intertime zone and inter-area satellite tie-ins; only to the countrywide direct to user application.

3. Most of the large scale in depth systems studies this observer has learned about suggest that local area program development, participation, competency development and frequency spectrum space conservation are very important parts of a countrywide mass media communications system; if we want best long time results.

A. A contention here following is that in a well developed country, relying largely on communications for education, growth, and commerce, these desirable features are in the limit severely mitigated against by having a large portion of a country's communication channels operate in the direct domestic satellite off-ground mode.

B. And this is to say that we should not recommend to WARC-ITU that countrywide direct to user domestic satellite broadcast service be allowed on a large part of the civilian broadcast frequency spectrum.

C. It is further suggested that our publics can be and are being somewhat misled, and perhaps into wrong social decisions, by so much glamour and one sided publicity about the great "spacious fantasies" of direct domestic intracontinental satellite broadcasting, and so little about undesirable aspects of the situation, and, that instead,

D. We should be making more careful overall systems analysis and tell our non-technical public certain other and undesirable sides of the story. Making change for the sake of change can be very undesirable in some cases.

E. The mass communications system and government may do significant harm by not making more careful systems analysis and telling other non-glamorous sides of the story; sides that can have very undesirable longer term implications if not corrected in time.

4. We should take cognizance that as a result of several years of study and testimony from many national level experts the F.C.C. already pointed out that regularization of the off-ground airborne direct broadcasting principle would;

A. Bring about a too disruptive and undesirable change in conventional U.S. public broadcasting;

B. Be an undesirable and inefficient use of the public domain frequency spectrum;

C. Not be in the public interest, convenience, and necessity,

D. Etc.

E. We should also recognize that two decades past a 3-million dollar 3-year experiment by F.C.C., industry, and government armed forces, indicated the off-ground airborne direct broadcasting principle so obsolete and undesirable that not one single commercial entertainment direct broadcast station (radio or TV) was ever licensed or put into service since that time.

F. This observer was involved in another off-ground broadcasting experiment into areas in 6 neighboring states, and along with some fellow school board members concluded several years of time and 15 to 20 millions were not very profitably spent. Some districts that wanted local ETV systems and programs suited to their area needs could not have same. Not one district of the several hundreds in our Chicagoland area could have even one channel for local independent application, but the airborne experiment, with its satellite stations pre-empted/usurped the only 4 UHF broadcast channels remaining. And, in addition, we spent a lot of tax money having to tape and rebroadcast programs because of time zone change schedule differences.

(1) In Detroitland the same saturation condition applied, where the second largest district in the state of Michigan tried for several years to get just one channel; but could not because the off-ground (equivalent in communications system principle to the off-ground domestic satellite) broadcasting airborne system was usurping/pre-empting 4 channels with the kind of broadcast programs that did not meet local needs of many districts.

(2) This same off-ground broadcasting operating group reported on and suggested a plan to the F.C.C. for a 6-channel nationwide off-ground airborne system; wherein a partial systems analysis, using data from FCC Eng. Report 5.2.2, conventional UHF broadcast practices, and European study data, showed that the plan would have usurped or pre-empted 3 to 5 thousand independent simultaneous local applications in the same frequency block. This is a terribly inefficient use of the frequency spectrum, to prevent local independent public use; see "Some Air Vs Ground Based Broadcasting Utilization Illustrations - TAE021063-LM1" for further details Fig. 1.

(3) A further undesirable feature of this mode of broadcasting concerns the inter-time-zone inefficiencies, causing undue repeats and rebroadcast losses (see par. 4F above), as actually experienced in this area for several years.

(4) The F.C.C. in the past denied the expansion and regularization of this off-ground broadcast principle of distribution.

(5) For a number of reasons, appearing other places in these comments and references, the domestic intracontinental direct broadcasting (to homes, schools, etc.), satellite is a much worse mode than that used above for illustration.

G. Another example of usurpation of the local ground based application by an overriding interfering air-based off-ground (or satellite) system follows. This observer has been a member of a state and metropolitan ITFS (Inst. T.V. Fixed Service) F.C.C. sponsored utilization study committee. After some study, watching, press releases and general information to school people, some school people decided there was real question about using significant public school time and money working for ITFS when this ground based application could be largely negated by the use of many of the same frequency channels in the air-based off-ground mode (which we understood had been OK'd by the F.C.C.). A consultant to this committee informed us that the same conclusion had been made by some citizen and school committee people of another large midwestern city and metropolitan area. This was especially important since there were really too few channels, already incorrectly laid out in ITFS, for maximum and economical use to schools in the long run ahead. Why spend large sums of public tax money in such high risk ventures where a careful comprehensive systems analysis would

indicate poor chances for long time success because of this usurpation feature. And, if we read between the lines in this 18294 docket, where "up' earth to satellite channels are proposed in this same ITFS band; the situation could be qualitatively made still worse, it appears now.

H. The above mentioned points are only a part of other and undesirable sides of the story, that seem to have, so far, been completely ignored in the current considerations and publicity on the domestic satellite being authorized on top of or over-riding our U.S. broadcasting system. We must remember that these very undesirable spectrum utilization and inter-time-zone scheduling inefficiencies do not get really noticed until they begin to cripple results near or approaching system high duty or saturation conditions. It is suggested that in the public sector, when we really begin to need all the spectrum, this off-ground domestic direct broadcasting system application on a large part of our channels, could bring about a much worse frequency spectrum crises than we have in the land mobile services. The broadcasting industry could easily find its broadcasting throat cut by channel usurpation/pre-emption of the off-ground mode of broadcasting in effect superimposed upon the same channels; space usable many times over in the ground-based mode.

J. It is suggested that a careful systems analysis will show that for equivalent flexibility, local control, competency development, spectrum efficiency, and program participation the off-ground direct broadcasting mode, including domestic satellites, will be many times more costly than the ground-based broadcasting mode! This is important!

K. Therefore, my thrust here is that domestic direct satellite broadcasting in a large block of our B.C. channels should not be recommended nor allowed, in a developed economy relying on communications as a large growth factor; either on a national or international (intra or inter-continental) basis;

L. Except in very special cases of underdeveloped nations or large underdeveloped areas where there is plenty of time to amortize out the direct satellite subsystem and phase in a ground-based system before heavy civilian frequency spectrum use is anticipated/needed.

M. We should not repeat, for a third time, an error of significant time and resources losses in the society by redoing a principle or procedure already tried out a couple of times in considerable detail with failure resulting.

5. In case of a desire to consider these conflicting communications principles in greater detail, see the attached "Notes and Exchange of Views on the Domestic Intracontinental Direct Broadcasting Satellite - TAE081569LM1", and (Item A) Ed030768, (Item B) TAE021169, and (Item C) TAE021063; illustrating some of the magnitude and detail of one part of the overall subsystem problem. The (Item C) is an atempt to pictorially illustrate some of the longer time communications systems implications of the off-ground mode of distribution, in the direct to user civilian sector.

A. These items were done for fellow school board members and school people in the educational sector but since the communications systems principles are the same in the commercial as in the non-commercial sector, it is more convenient to use them to point up my plea for much more social, technological, and comprehensive systems analysis, of possible undesirable features of the off-ground domestic direct broadcasting satellite, before we recommend worldwide rules that can permit the satellite mode to over-ride the same channels in the broadcast mode in any developed country.

B. There are many other well made points in this docket, which have already been addressed, so that I do go over them again except perhaps to emphasize some factors. My main thrust is to get these inefficiency and undesirable features of the domestic direct broadcasting mode of satellite communications out in the open - so we can get a better systems understanding and make better decisions in the public sector, and also provide for better utilization of the public domain for the greater good of more people. Failure to make a sufficiently careful systems analysis and omission of information can so easily lead to premature and incorrect decisions in such a fast moving technology as telecommunications; incomplete communications can even adversely effect the industry and what it could do for people.

6. In connection, admittedly, with the question of semantics, I would very much favor the use of a descriptive phrase Satellite Broadcasting Service as much more definitive than "Space Service"; because it gives the non-technical person a much better idea of what we are talking about, and ties it in with the continued publicity.

7. It is obvious, from the above comments, that I would not favor assigning or footnoting satellite, "rural", or "community", off-ground broadcasting, into the proposed rules, for more than a very small portion of our broadcasting channels; nor make same as a recommendation of this Docket 18294 to WARC-ITU. This would obviously not mean granting "satellite broadcasting access to any channel now allocated to our regular broadcasting". A prime thrust of these comments here is that this could be the beginning of the end of local broadcasting or much collective listener/viewer preference (F6) decision making.

A. The same principle holds for either aural or visual broadcasting in the civilian sector!

B. I would certainly and emphatically agree with the F.C.C., over EIA-Sat. or G.E., that space services should be better defined and specified in stipulated bands or spots (F7) within the international picture.

8. The comments above seem to justify a conclusion that there could be many other things that should be considered about this docket as well as 18261, 18262, and 16495 before making final response to WARC-ITU. I think that there should be significant joint FCC-industry-citizen consideration of such matters before recommending to WARC-ITU: anyone of these groups alone could make serious mistakes and/or omissions. It would seem worthwhile to have a separate inquiry concerning the direct satellite broadcasting subject, because of its extreme import, and to more solidly tie in with the other dockets (F9).

9. It certainly seems to be a very unworkable and uneconomical proposal to permit satellite over-riding of lower frequency regular broadcast channels when the latter are not in regular service, (10) time sharing.

10. With respect to permitting or footnoting direct satellite occupancy on any or all usable local U.S. regular broadcasting channels (such as 88-100 M.Hz block), with or without participating administration's agreement (F11), a good question is, what would prevent U.S. disagreement and all other administrations agreeing and going ahead and blocking out local U.S. community channels? What could citizens in the effected country or area do about it? Especially when, as pointed out by CCIR and others, concluding, co-channel simultaneous sharing will probably not

work out. It seems doubtful that signal flux density limitations could be handled (F12) satisfactorily.

11. The "Community Receiver" concept applied to an undeveloped country was suggested to AID about 1961 as a legitimate use of direct off-ground broadcasting mode to collective community receivers (F15) for educational purposes for schools and villages; but using same far enough from any other country not to interfere with established broadcasting in the latter area. This would seem to be a class of service rather than a grade of service; as for example the upcoming satellite service to India. It would seem that a very careful educational and technological systems analysis might show that the more conventional air-borne (like MPATI or Stratovision) mode might be significantly more economical and flexible than the satellite approach; especially when one considers the problems of many languages, power sources, conventional T.V receiver availability, time zones, grade levels covered, etc. It would seem that this intermediate mode of off-ground direct broadcasting should also be allowable, within any proposed rules, as well as non-sync. (F15) satellites.

12. The suggestion of accomodation to (DAMA) Demand Assignment Multiple Access" approach for low demand users in remote areas at down frequencies of 2150-2200 M.Hz with earth to space "up" channels at 2500-2550 M.Hz (ITFS band) sharing seems like an excellent approach if the "up" channel sources can be separated from higher density areas (F17). When it comes to "sharing co-equally with the fixed and mobile services" one would want to assure a careful systems analysis including the different bandwidths, more open antennas, greater sensitivities, etc.

A. As an in-school oriented person and member of a metropolitan ITFS Committee, and, since JCET (F25) suggested greater worldwide recognition and consideration of the ITFS 2500 M.Hz block, it seems in order to point out that various school people and studies have suggested that simultaneous 2-way ETV interchange between educational units within districts and between districts, with a proper ratio between outgoing and incoming channels, is necessary for real effective and economical use as a workhorse educational tool, and that more lesson/communications channels are necessary to make the system really worthwhile and effective.

B. As was discovered long ago by F.C.C. and industry, for maximum spectrum utilization and operational economy some useable separation was needed between two channel groups (450 mc mobile-mobile common carrier telephone - latest move to the 5 M.Hz block separations in the mobile services - etc.). But this condition was not set up by the F.C.C. in ITFS (2500 M.Hz). (So that there still is some question about the long time implications of ITFS). Potential is great, but lesson channels too few.

C. Again, if we were to make such WARC suggestions we should make some more careful overall educational telecommunications technology systems analysis, than this observer has so far seen, so we can more effectively look further ahead, and make more suitable suggestions, also perhaps for 20 to 30 channels in the region 1900 to 2300 M.Hz for ITFS. This would provide the two way interdistrict internet interbuilding capability and multichannel channels previously mentioned.

D. In addition, there seems to be some evidence of need for wider bandwidth for some educational applications, more lines per inch (also for some kinds of electronic data processing). If one is looking far ahead system-wise, this point should be well considered - perhaps by combining 2 adjacent channels for some applications when needed, and with no chance of interference by direct superimposed satellite signals.

13. The proposed "Preliminary Views" to WARC-ITU mention that CCIR studies indicate "a serious problem of mutual interference if the UHF T.V. channels are shared between space and terrestrial systems", Throughout this whole picture and deliberations very little cognizance seems given to this CCIR warning, or the UN working group; thus the repeated stress of my comments on the need for much more careful and comprehensive telecommunications systems analysis (PV6). This need is an extremely important thrust here; without such careful and thorough systems delineation and analysis we can so easily get into deep trouble at a later date. It is suggested that thorough and high level systems applications analysis comes even before the experimentation so rightly suggested.

14. A suggestion here is that the F.C.C. "Preliminary Views" to the WARC-ITU be coordinated with all paragraphs numbered; like the F.C.C. Dockets. This greatly facilitates study, reference, understanding and discussion, and makesparticipation much easier and more effective.

15. In response to the question on page 7 of "Preliminary Views", about how to provide "up", earth to satellite, channels, this observer would suggest that if a decision had to be made now, the lesser of the two undesirables would be the number two approach of the permissive footnote on selected bands allocated to the communications satellite services, without change in current definitions (PV7).

16. It is recognized here that intracontinental space or satellite direct broadcasting regulation will be difficult because while it should not have a place in a developed country (because of severe spectrum, economy, and local use insufficiences in part prevously mentioned) it could have some relative short time justification for an underdeveloped country where initially there are no land line or local broadcasters. It is a contention here that these extremes, and the reasons for them, must be made in any viable social and technological systems analysis, a good telecommunications system is a great thing, but a bad or incorrectly applied one can be very bad for all concerned.

A. A good communications system can be a tremendous unifying and economic growth force to viable nation forming. And a direct broadcasting (the community aspect mentioned in the docket) space system, though a very inefficient use of the spectrum, might be a good thing -- until the time when efficient use of the spectrum by the people is needed. Then the system should be replaced by land lines and ground based broadcasting. This observer has not seen these social and technological systems trade-offs, or public domain utilization efficiencies, even mentioned in the literature or such proceedings as this, except in one case from Europe several years ago. A thrust here is that in a case as important as this docket we should more carefully present these potential trade-offs and factors that may effect different sectors and applications differently.

B. These new rules being proposed for WARC should definitely provide time limits or spectrum use limits for direct intracontinental satellite/space broadcasting, so as to warn the public/users that great trouble and telecommunications restricting factors can come into play as spectrum use may become high as a nation develops; so that a people can be better prepared and warned to make longer time planning programs for their own protection in the light of progress, and the protection of others, their neighbors. The powers of space communication are just as great for the bad as for the good. Exclusive of the efficiency problem, local or small nation people cannot do much about space communications channel raiding and usurpation, but they can do something about

local area programming for their own development and growth; allocating satellite direct broadcasting over-riding over all broadcast terrestrial channels can negate local control.

C. We must devise or permit methods of control/regulation that will allow a people/country to maintain access to spectrum for terrestrial use! People must not be moved, by wrong or insufficient technological communications applications, into a situation where their own or neighboring terrestrial systems can be severely interfered with; or where an over-riding system is allowed to go so far and become so big that its longer time efficiencies are severly limited.

D. This is exactly what can happen if the intracontinental domestic direct space broadcasting principle is allowed to dominate, usurp, or over-ride the terrestrial radio system; and this is the serious situation that is not being given recognition. The people cannot take steps to protect their local broadcasting control and spectrum use if they are not given the whole story. If the people get and understand the whole story they will make the right decisions; if they have that chance before satellite/space direct broadcasting gets a chance to dominate or become such a big communications empire that by restricting or incomplete communications it can perpetuate itself. This is a danger. A thrust here is that now is the time for the F.C.C. to point out what can be done to protect we the people in the longer runs ahead. This is one of their functions. Becuase of the potency of the mass telecommunications machine empire it can easily mislead the public, if only by omission and emphasis.

E. As a country becomes developed and needs the full and maximum use of the communications frequency spectrum it has less and less need for a direct space broadcasting service on most of its broadcasting channels. A direct broadcasting satellite system should not get started, or be forced sharing, with a major portion of terrestrial broadcasting channels; unless the latter are intended to pass out of existence in the locally controlled mode of operations (time limited). Only a very small portion of its channels might be justified for space intercontinental, inter-time-zone areas, commercial, etc., inter-station connections. This is an important systems point. The general use of channels for direct space broadcasting should not be permitted on a large portion of terrestrial channels, and when so permitted should have rigid time or application limits! Unfortunately and admittedly, this will be hard to do because of the progress and change rate of the technology; but that makes it no less important!

17. The F.C.C. is to be commended for freeing possible restraints on amateur use of space communications techniques (PV23), and carefully recognizing Radio Astronomy Service (PV15).

18. These comments could obviously not reflect favorably on proposed sharing criteria (VA50) when the thrust here has been in the main that domestic direct satellite broadcasting (to homes, schools, etc.) should not be allocated over-riding co-channel with terrestrial services for a major portion of such regular local broadcasting channels (radio and TV) directly serving the public and schools.

19. With respect to the proposed draft resolution concerning "Coordination Distance for Earth Stations" separating space and terrestrial subsystem elements, it should be noted that perhaps hundreds of ITFS subsystems, some places intermixed with an "up" earth to space station might

easily be involved within this minimum distance proposed; suggesting another reason for satellite/space services not being allowed on the same and terrestrial broadcasting channels. This is especially important here in a service where there are already too few channels to do a good and desirable job (VA91), and it would seem that this situation would more likely have to occur in the more highly concentrated population centers, where program development and use would be greatest. Sharing would seem very undesirable in the broadcast portions of the 2 to 3 G.Hz region. Suggestions have been that if this ITFS service is to be really useful and worthwhile there may have to be another block made available to complete the 2-way interconnection function.

20. Commissioner Lee's concurring statment seems to indicate a feeling that in one sense he also concurrs with Commissioner Johnson in thinking the application of direct satellite broadcasting should be significantly hastened. As one of those people who would be effected by this direct broadcasting, but as a private citizen as well as in the educational field, I take some of their "solace" for an entirely different reason; because there will be more time for the people not now being heard in these proceedings to learn the other and undesirable sides of this subject and make themselves heard, and because I do not want the F.C.C., the ITU, the broadcast industry, or educational ETV'rs, all far, far removed from me and not knowing what I need and want, capturing my channel and broadcasting things I cannot use. I think I have as much or more right to have a communications system that will allow me to use this public domain in my area in a manner that does help us collectively in my area. If a remotely controlled over-riding pre-empting systam has control of my channels, so that I cannot use them, then I have to turn them off and find a different way to find local control and locally applicable communications, even if it costs more. We have been through this experience and testimony in this 6-state area.

A. As a parenthetical but pertinent comment I suggest this is what happened when all these years so many UHF-broadcast ETV channels lay fallow for the in-school educational application. Why should school boards of the country spend large amounts of tax payers money resources for education for a system that could never be a real in-school workhorse tool and worth its cost? We have too little educational resources available to be buying inefficient educational tools. (We are using a little of out-of-school ETV broadcasting as some samples of the art, in some of the cases where it is not too costly and may help us keep abreast of the potential; but not as the real workhorse in-school tool it could be if we had ETV in the right mode). Some of we school board members, who have the legal responsibility to make most of the prudent and economical school policy in this country, are beginning to think so many restrictions have been thrown upon ITFS application, that it will probably never be the really new, evolutionary, and great tool it has the potential for if it could be applied in the proper way; and if remote out-of-school control could be converted to an in-school oriented sector program and control. If ITFS continues to be set up so we cannot use it in a real effective way then I predict those responsible for a communications starving in-school situation will have to find other ways; even though the need and potential are so great for the former.

B. Again parenthetically, but very pertinent, over a third of a century of experience in communications and education leads me to believe that the greatest evolutionary and most helpful tool on the national and international educational horizon is correctly applied

educational telecommunications technology; absolutely tremendous in potential, but I sorrowfully find none of Commissioner Lee's "solace" in thinking this will ever come about, as long as out-of-school education, which is big and tremendous and powerful because of the communications broadcasting, and the communications industry, F.C.C., and broadcasting continue to run the show from their out-of-school orientation and demonstration of an apparent lack of in-school thinking and understanding. When it comes to individual homes and schools, rightly mentioned so often in the domestic satellite broadcasting publicity, and in this docket proceedings, and where indeed the potential is so great, I find little "solace" in the one or too few sidedness of this great and bludgeoning communications industry; it can miss some potentially great targets of good so very very far.

C. Further paraphasing Commisioner Lee's "solace" reference, I do not find desired "solace" in the situation where in referencing the broadcasting communications industry he recognizes "....direct satellite broadcasting may supplant terrestrial-based stations", but in the part of this docket proceedings I have seen, its public notice, the publicity I have seen in the commercial communications sector, I do not see that same concern that this particular mode of domestic direct broadcasting may 'supplant' my effective use of my area terrestrial-based stations for my home and my school. This is my main fear and thrust here; but not mine alone, because I have discussed this with dozens of communications engineers and in-school people in recent years, some at national level.

D. I would raise a serious question about not finding in this docket picture participation of 'we the people' "homes and schools...", who are most effected by what other people remotely situated may be trying to do. I question some of the benefits of this great communications system, and it is truly large, when it decides or lapses into communicating only with its own people or on subjects it alone chooses to communicate. If I were Commisioners Lee and Johnson, I think I would have worried more about this competition of services than existence of business or profit competition to terrestrial broadcasters. Contrary to the docket comments, I think there will be many who do take "solace" in, or pray for "...The Divine Powers..." to be on the users' side for a while and "....make satellite broadcasting forever an impractical scheme", or at least pray for time to find some really substantive systems analysis information dissemination to bring out the whole story and its future implications.

E. I believe Commisioner Lee's statements that "....direct satellite broadcasting may supplant terrestrial-based stations" is literally right; but not for what I understand was his reason - because of competition with terrestrial broadcast. The reasons are technological, down to earth hard cold communications systems technical facts about the services proposed; as have been my attempted thrusts above, and the attachments hereto. Technically in general in the longer run, for this particular phase or mode of direct satellite space broadcasting, space broadcasting at some of the frequencies does exactly what Commissioner Lee mentioned - it can "....supplant terrestrial-based stations", and those under that coverage area have no alternative but to listen/view or turn it off; and in either case they cannot use their own public domain channels for their own or any other use. Again, this is the issue and thrust here. This is communications 'hijacking' of the worst order.

F. And again may I impress the point that I am not objecting in any way to certain other uses of telecommunications satellites; I think

they are wonderful, in the proper subsystems concepts and rules, and have much potential -- but not on my local home base or school channels in this particular one of several possible applications. I am suggesting that new WARC rule recommendations do not barter or sign away a large portion of my use of the public domain; and, I contend there is precedence within the FCC past communications systems history, and communications sciences for this thrust!

G. I see no comparison between the "competition" of UHF terrestrial broadcasting and CATV, and between satellite and terrestrial direct broadcasting. They are two different kinds of competition; the former economic and servicewise, and the latter technologically conflicting interference when high duty cycle capability and very existence could be the limiting criteria. This is the part of the story that seems is not being communicated; communications, the lack of which could result in national and international decisions inimical to both the terresterial broadcasting industry and to us home and school people who need so much more and better local communications subsystems. The need and potential are so great We need maximum mass utilization of local spectrum, and for all sides of all questions about it!

H. It does indeed hearten us to see Commissioner Lee's enthusiasm on the "....the real prospect for effective use of television for educational purposes" and to "....give terrestrial broadcasting the assurance it deserves"; but, a thrust here is that ruling-in an over-riding domestic direct broadcasting system, directly on a major portion of terrestrial broadcasting channels, is not the way to implement these desirable outcomes. This would be government sponsored channel 'hijacking'.

21. I heartedly approve of Commissioner Nicholas Johnson's dissent, but for an exact opposite reason than appears to be his reasons. He apparently dissents because he thinks the majority action will delay the implementation of direct satellite/space broadcasting.

A. I dissent on the"Preliminary U.S. Views"on recommendations for WARC-ITU, because the 'ruling-in' of an over-riding remotely controlled direct broadcasting system in general prevents my use of these same channels in the locally controllable terrestrial broadcasting mode. I have some creative, programming directing voice in locally controlled broadcasting (as Ford studies, the Carnegie Study, Pastore's Senate Hearings, and others, tried so long to teach us was sorely needed)in the society, but neither I nor my schools have much to say about what the remotely controlled national and international out-of-school oriented and communications segments do with the spectrum channels in the space mode. This is a part of these comments thrust that needs much re-examination and publicity!

B. I strongly and loudly agree with Commissioner Johnson that we "....have simply not been provided the information and analysis necessary to conclude that these proposals are the wisest course of action to follow". This is why my thrusts for greatly increased comprehensive systems analysis of the international systems picture, as well as the educational telecommunications systems technology picture, how the local and national and international subsystems can complement each other, and for wide dissemination of this information to the people who are to be effected! A big question to be asked is will we adequately get all sides of this picture via a mass communications system, if the systems direction does not understand and participate in the end results, if there may be some possible fear of the industry being adversely effected, or if they do not understand or are not oriented in the end result area or

users' needs? Can they adequately talk about what ought to be done for the other fellow when they do not yet talk his language or understanding?Does the commission know enough about my public and educational communication needs in my area to protect "....the public interest in this field"? There have been comments that the records and performance shows that they do a lot of listening and participating with the communications industry and broadcasters; but where do we hear that they give equal attention to the local users out on the firing/listening line - those broadcasted to?

C. Commissioner Johnson commented on "The possibility of interests other than those represented by private corporations fearful of competing technologies has not received the attention I think warranted". This, I applaud, as just indicated above. This is a big need, before U.S. approval of recommendations to WARC-ITU for worldwide rulings and agreements. He also referenced "Private interests...." hoping for delays in the implementation of 1970-1985 time frame estimates; I am one of these interests, not for competitive selling reasons, but because I do not want my local terrestrial broadcast channels usurpted by satellite broadcast operation in the longer run ahead. I am not afraid of local program competition, but I am afraid of technological remote satellite control, at the international level.

D. For these above referenced and other reasons I also dissent with Commissioner Johnson, but just against that part of the proposals in the "Preliminary Views" to WARC that would over-ride direct domestic satellite space broadcasting onto or upon the majority of our domestic locally controllable terrestrial ground-based channels. I do not want to have my commercial or non-commercial (educational) broadcasting throat cut by such changes in the rules. Places for sharing are severely restricte or limited.

22. The objection portions of these comments are not intended to apply to the many other services and applications well covered by the commission. In the main they apply to the lower frequency (.01 to 3 G.Hz) direct to local user (homes-school-etc.) terrestrial broadcasting subsystem channels. This observer suggests that the space satellite services will be a very important subsystem distribution element when used in the proper subsystem mode of the greater overall national and international intercontinental telecommunications systems picture; where that new mode does not, because of the nature of the frequency and application, conflict, pre-empt, or interfere with the local mode of broadcasting; the thrust discussed in these comments.

23. This petitioner, for the presentation of some comments in this docket, appreciates the opportunity to make known some concerns relative to some parts of these proceedings. It is hoped that the comments, and attached further explanatory detail materials may better illustrate the importance attached to this subject and some of the several reasons why we should not make an international recommendation for worldwide implementation of direct domestic intracontinental satellite/space broadcasting, on a majority of our established domestic ground-based terrestrial broadcasting channels, especially those applicable to local audio or visual educational broadcasting. Thank you for the opportunity to comment.

24. Fifteen copies of these comments are attached.

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TAE081569LM1

NOTES AND EXCHANGE OF VIEWS ON THE DOMESTIC INTRACONTINENTAL DIRECT BROADCASTING SATELLITE

1. As a result of noting an ever increasing amount of news comment and high level governmental concern that could leave the impression that domestic intracontinental telecommunications satellites are desirable for direct to local or mass user (homes, schools, etc.)broadcasting, it seems appropriate to make some comments from the educational communications technology point of view. Having been first involved in 2 university educational and also commercial radio broadcasting operations over 40 years ago, educational television for 15 years, school board activity for 2 decades from local to national level, communications systems engineering for over 30 years, and long working for frequency channel conservation in the public domain, I could best comment on the educational and home aspects of direct domestic satellite broadcasting. Believing that a careful educational telecommunications systems analysis should include consideration of undesirable as well as desirable features, I suggest that there are some very undesirable and inefficient aspects of direct domestic local satellite broadcasting that have been ignored in the great amount of publicity and consideration exposed in the last couple years. It is suggested further that this particular off-ground mode of the several distribution modes for information and knowledge dissemination, is a very undesirable direction for the longer pull ahead; and also that it is just as undesirable and inefficient in other than educational direct broadcasting applications. I have not seen this part of the story being told, and because of this, many seem to have gained an incorrect impression of off-ground distribution, and could, therefore, make some very serious and undesirable social decisions. This is especially important when we see, in our emerging communications-electronics culture, how fast change is coming about. Without knowing more about all aspects of these large, costly, and sophisticated systems we cannot make the best longer time social decisions record; a record which has not been so good so far because too many subsystem factors were overlooked and/or insufficiently considered.

A. I am very much in favor of the domestic intracontinental as well as the intercontinental communications satellite for certain commercial and national security communications, but,

B. Point out that the communications satellite (off-ground distribution) is very inflexible and inefficient in frequency spectrum utilization in the direct to public user mode (homes, schools, etc.), and,

C. Therefore, the direct broadcasting domestic communications satellite in a developed country is an undesirable, inefficient information distribution application, (from the non-government spectrum point of view)

D. The direct broadcasting mode or application may be a usable one for a temporary system in an underdeveloped country or area, where time will be available for a later economical shift to ground-based direct broadcasting, as high density frequency spectrum usage becomes necessary with the development of that area or country,

E. I suggest that any thorough and viable systems analysis for country or world-wide use of direct satellite broadcasting should bring out this undesirable feature of the communications satellite system. So far as I see, the considerable amount of publicity on the communications

satellite, in both the popular and technical press, there has been too much emphasis on the domestic intracontinental direct broadcasting mode or application. I suggest further that this confuses too many people, and leads to an erroneous conclusion that we should expend social effort and money on developing the off-ground domestic satellite mode of distribution for direct local home and school educational broadcasting, and,

F. A careful study of large area, national or international, communications distribution should specifically overcome a widely held misconception that direct satellite broadcasting is a desirable goal in the satellite picture.

2. Some social studies have pointed out that communications, transportation and technology, have in general, when correctly applied, enhanced the personal development of individuals and great overall progress. More and more communication is substituting for older functions.

The Carnegie study, resulting Pastore Senate Hearings, and Public Broadcasting Act, placed great emphasis on the importance to our society of local area entertainment and educational broadcasting diversification development and frequency conservation across the nation.

A. I suggest that a careful communications-social systems analysis will show that the domestic direct broadcasting satellite is in direct opposition to this desired program diversification and frequency spectrum conservation we need in the long run ahead for maximum benefit of more people. These points are very important & need wide dissemination.

B. Therefore, it is suggested that any national level policy consideration, such as so often we are hearing about recently must more carefully study and delineate this particular one of the many communication subsystem modes of communications distribution; showing the undesirable as well as desirable implications for the future. Most of the studies I have seen rather completely ignore this phase of the system (the full system details of direct domestic satellite broadcasting).

3. Since, from the national level or point of view, we seem, I think rightly, to be looking towards significantly improving quality and quantity aspects of education, since this has long been a special concern of mine along with the pervasiveness of electronic communications in our "communications culture" and since this principle of on and off-ground (satellite) broadcasting is probably of high future impact in this application, may I suggest considering a couple of schematic systems illustrations, done for some fellow school board members; illustrations of the importance of more comprehensive system and subsystem considerations; if further illustrations are needed to make the thrust.

A. The attached (Item A) Systems Flow Chart for Education-Business-Industry Study/Action Program for Public/Private Education and Training Ed030768EIALM (86m), is an attempt to show the needed comprehensiveness of any good educational telecommunications system technology, to get into this sometimes bewildering myriad of educational subsystems in the society (an extremely important need). Good education is good two-way communications; so much in need between these many interdependent elements of the society.

B. The attached (Item B) "Illustration of a Suggested Approach to an Educational Telecommunications Systems Technology Analysis - TAE02-1169LM2B1A", illustrates an approach to 'systematize', on one sketch, the breadth or comprehensiveness of a local to world-wide telecommunications distribution network, including the communications satellite in both inter and intra continental modes; just a beginning approach to better illustrate the points.

C. This (Item B) world-wide communications system (important to any group that is to examine domestic satellites) must, I suggest, consider meeting the local intracontinental requirements of (Item A) society's educational as well as other communications broadcasting needs at local level; the latter and educational sector being illustrated at the right hand side (Local Area Phase) "Niles Township", point "AA", for starting consideration detail.

D. It is important to remember that the (1) "Local Area Phase", (2) "Phase A" primary statewide distribution network, (3) "Phase B" interstate connections, (4) "Phase C" Fig. 1 domestic trans or intracontinental exchange, subsystems, are in some places already in existence and formal realities. What remains of the (Item B) total system is to formalize and make practical the satellite phases (inter and intracontinental); the subject, I believe, must be much better considered from the national policy point of view; a subject needing much more careful overall systems analysis and discussion countrywide. Telecommunications is becoming much more vital element in society's development; substituting in a measure for older functions, such a part of transportation.

E. It is obvious, communications systemwise, and as indicated by several studies, that one or two way direct broadcasting for local or state use needs be multi-multi channels (combinations of air and cable borne actually), and that moving to off-ground direct broadcasting (domestic satellites) is a move in the wrong direction of less local flexibility and far less frequency spectrum utilization; a very hard cold fact of the present and anticipated state of the electronic communications art - but one that must be dealt with if we are looking for the greatest utilization of the very limited frequency spectrum in a developed country. This vital point seems to have been completely overlooked.

F. This is a main thrust of these comments and discussion; the exact opposite of that made so often in both the public and technical press on satellite broadcasting. Many of us are being led astray by continued impressions of the need and so-called advantages of domestic intracontinental Direct Satellite Broadcasting. Nothing could be further from the technological hard cold truth - the facts of electronics communications life are contrary to the generally released publicity and writings about satellites. People and writers too easily become intrigued or mesmerized by continued illusions to the grandeur or glamor of these local "spacious fantasies", and,

G. Unfortunately, these facts do not show up in such a system until the duty cycle saturation limit is approached. This is a critical issue; will we start in the proper direction for maximum potential implications, or will we start in a direction (of domestic direct to home and school as an illustration) that will have serious undesirable future implications for serious frequency spectrum saturation limitations in the longer run (a reason I made previous reference to the difference or distinction between the application of direct broadcasting domestic satellites for developed and underdeveloped countries - there are also other significant subsystem features that need as careful considerations). Since we have not yet been practically confronted with this limiting condition, too many people involved have ignored it; but finally systemswise it cannot be ignored, unless we are again to be too early confronted with the kind of frequency spectrum limitation crisis we now have in this country in the 2-way mobile commercial and public safety communications services. This is very important for a developed country needing communications to the saturation point; but not so important to an underdeveloped country where there will be time to change out systems during development!

4. Now as to some further and more detailed considerations, see the attached (Item C) "Some Air Vs Ground Based Broadcasting Utilization Illustrations - TAE021063LM1" giving some quantative suggestions resulting from hard cold technical limitations. This 021063 illustration is another way of showing the very undesirable frequency spectrum and intertimezone scheduling inefficiencies of the off-ground or satellite broadcasting mode, serious obstacles to final saturation capabilities. This principle and showing of off-ground broadcasting mode deficiencies has been impacted upon this part of the U.S. for a several year setback and 20 million dollar experimental educational waste in 6 states (see part of Fig. 1 marked in red - "6 state group"). This experiment was a sad actual example illustrating the thrust I am trying to make.

A. After several years of study and much testimony, the FCC rightly denied the expansion of the off-ground distribution mode system because;

(1) The off-ground broadcasting system would too undesirably disrupt U.S. broadcasting,

(2) This principle or mode of broadcasting is an entirely too inefficient way to use the public domain frequency spectrum,

(3) This mode of broadcasting would not be in the public interest.

(4) Etc.

B. Another 3 million dollar 3-year industry, government, armed services experiment 20 years ago proved this method so obsolete that not one single such commercial direct broadcast system was licensed or put into use since that time. I suggest that too many now seeming enamoured with the glamour of domestic broadcasting satellites are overlooking some of the hard cold facts of history and technological systems analysis.

C. This and some other equally undesirable long time implications have been rather completely ignored by too many people considering satellite broadcasting , and who may not be aware of the two previous costly errors, or who have not yet made a comprehensive systems analysis. Time is too short to make these mistakes over again.

D. Again, I want to point out that there are some other very beneficial and economical modes of intra and intercontinental satellite communications that are very desirable and viable, and needed; but my thrust is we should make much better systems analysis of the whole, and point out the bad features as well as the good, and thus not lead so many astray and wasting of their time and efforts at coming up with undesirable applications - a society's time and money waste that has already happened twice on a big scale - let us not make a third and bigger multi-multi million dollar systems error. When these communications and electronics systems directions become so all pervasive and large, we can really make some tremendous errors by omission - in the future let us leave the undesirable and glamorous "Spacious Fantasies" to others with more time and who can better afford the loss.

5. For some more specifics on the domestic satellite, see the attached (Item D) "Notes on July 1968 Future Communications Systems via Satellites using lower cost Earth Stations - TAE100368LMA" considering some aspects of a national level EIA subcommittee report to the "President's (Johnson) Telecommunications Task Force on National Communications Policy".

A. Note in particular (marked in red) paragraphs 5B, 6A, B, C, 7, and 8B, with the suggestion and illustrations why such a national policy should include "a caution that intracontinental direct to homes and schools broadcasting satellite, in the public sector, is a very undesirable mode of distribution"; and pointing out that higher level recognition and wider dissemination of this situation was needed.

6. Since the U.S. Congress (Public BC Act) as well as national foundation efforts have directed and suggested such studies, and another report is to be made to the Congress, "U.S., PBA, Commission on instructional Technology", I am attaching (Item E) a copy of a June 30th (TAE063069LM1) letter to PBA Title III "U.S. Commission on Instructional Technology" on their study of educational broadcasting, some of the content of which I think is applicable to these comments; and,

A. Because the applications mentioned there are significantly and directly applicable to the domestic satellite off-ground principle of direct communication of nearly all types. The principle is the same in either the public entertainment, public education, or commercial sector of direct to user broadcasting, and,

B. Because for too long already this critical factor has been overlooked, and,

C. Because unsuspecting non-technical people are being and can be misled into wrong social sector decisions, thinking, and resource allocation; let us just as widely disseminate other vital sides of the story.

7. As a result of being somewhat involved in educational and commercial broadcasting communications systems some 40 years, I have formed these, perhaps biased, ideas about this electronic/communications man-machine culture in which we now find ourselves, and hope some of the mistakes of the past and more careful systems analysis may show a better direction for the future; especially where it now appears we might be going in the direction of repeating a couple of the bad errors of the past. I must apologize for such a long comment, but since so much is involved, and simple short references did not seem sufficient in the past, it seemed better to be more comprehensive, even bearing on the repetitive, to make sure the several thrusts were better delineated. In something as important as this we must better consider and disseminate the whole story, and devise much more complete telecommunications-social-systems analysis. To do otherwise is to further deceive many that could be effected in the longer run ahead. I hope these thoughts may be acceptable as a part of further comments, considerations, news releases, and dissemination for the future. We need to tell a more complete and better story, more consistent with these times in a communications culture.

A. As a school board member and communications systems consultant, I have seen and heard hundreds of queries on comments about how great a thing the direct educational broadcasting satellite will be for homes, schools, etc., and why not just wait until all these great things will be coming direct to us from the sky - the glamour spacious fantasy approach. So many have gotten an incorrect impression of the direct Satellite broadcasting mode, that it seems time for someone with good exposure to point out the vast subsystem differences in the several distribution modes; especially the one discussed above. The technological implications information needs more dissemination into the non-technical social sectors. The glamour of these space age times may lead to too much intoxication with the exuberance of the verbosity of fictional reporting on some of these matters, leading some of us into more spacious fantasies, unlimited by such hard cold facts as practicality, cost, more efficient use of our communications frequency spectrum and overall systems feasibility. I am suggesting we get down to earth and put new effort closer to home where the big need and priority is now. Let us substitute more homework for some of these spacious fantasies.

LLOYD P. MORRIS, 2947 North 78th Court, Elmwood Park, Illinois 60635

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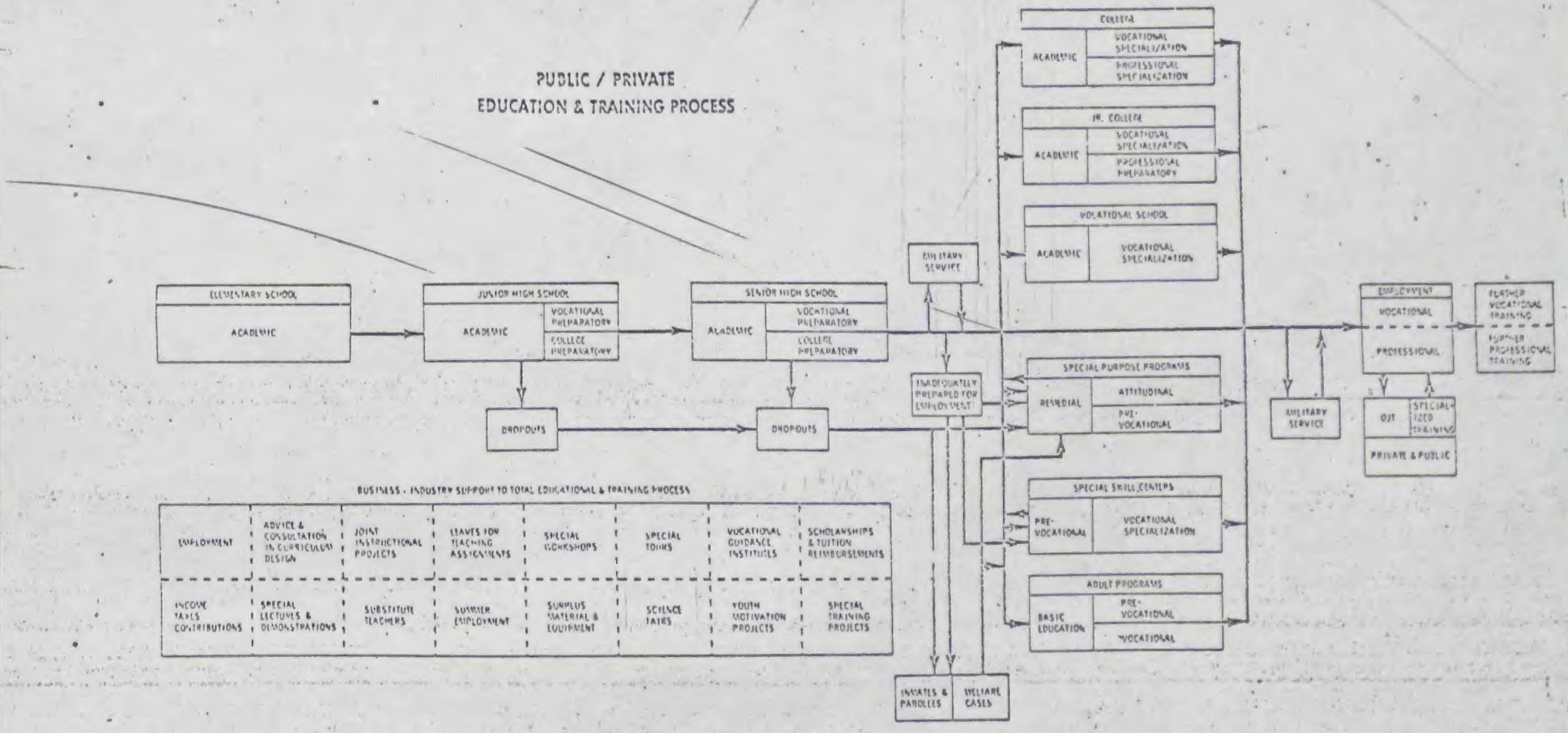


A

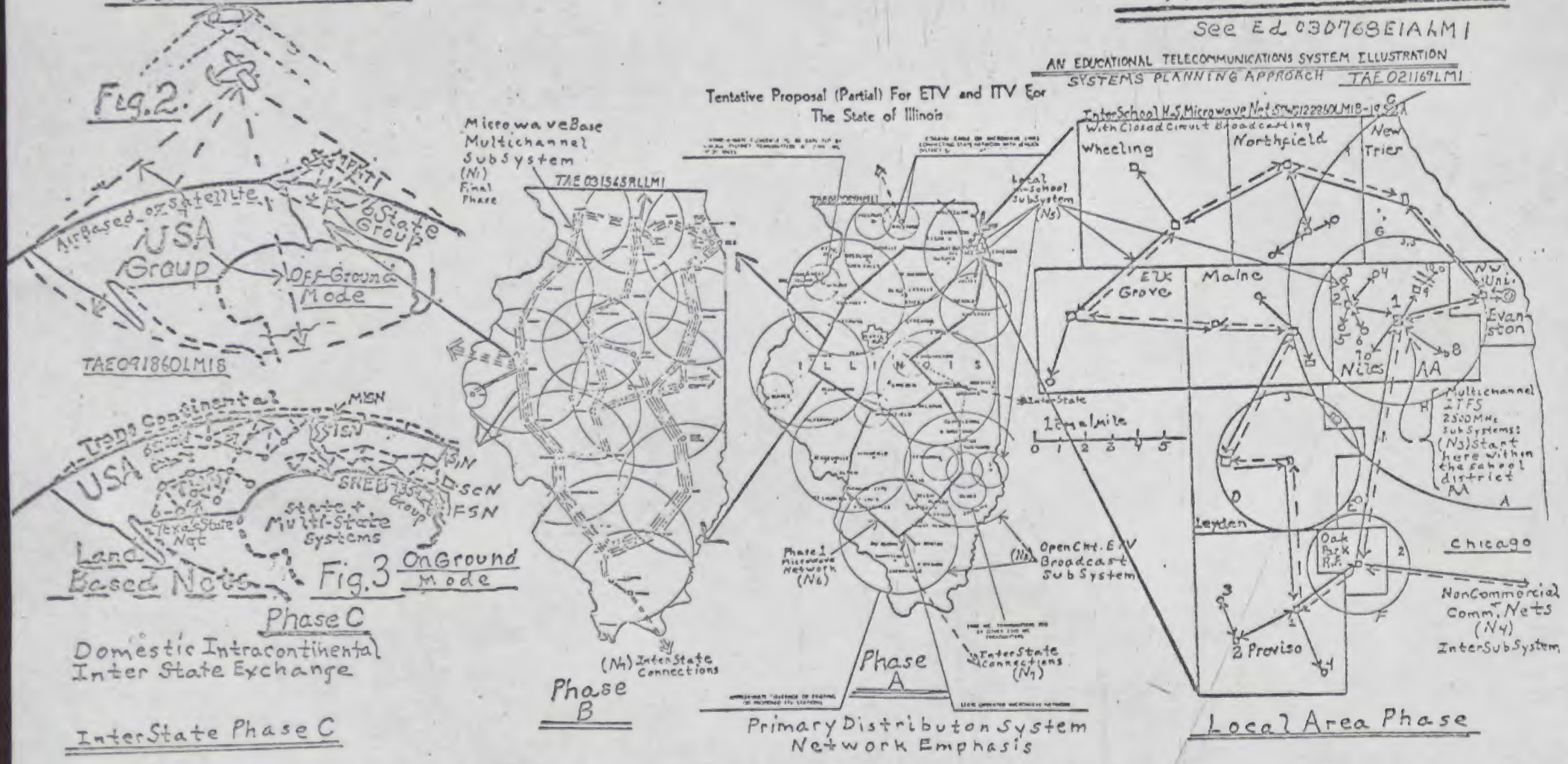
Systems Flow Chart For Education-Business-Industry Study/Interaction Program

ILLUSTRATION OF A SUGGESTED APPROACH TO AN EDUCATIONAL TELECOMMUNICATIONS SYSTEMS TECHNOLOGY ANALYSIS

(See Notes)

TAE021169LM2BIA

See Ed 030768EIALM1



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SOME AIR VS. GROUND BASED BROADCASTING UTILIZATION ILLUSTRATIONS

1. An air based country wide broadcasting system at the present state of the art results in only one lesson program per operating channel country wide or within the coverage area of the high altitude station. The ratio between usable operating channels to frequency spectrum space may be 1 in 3, 4, or 5, depending upon the application. (Figure 1) Any other program on the channel or within the guard bands would cause interference (AB)& A_1.
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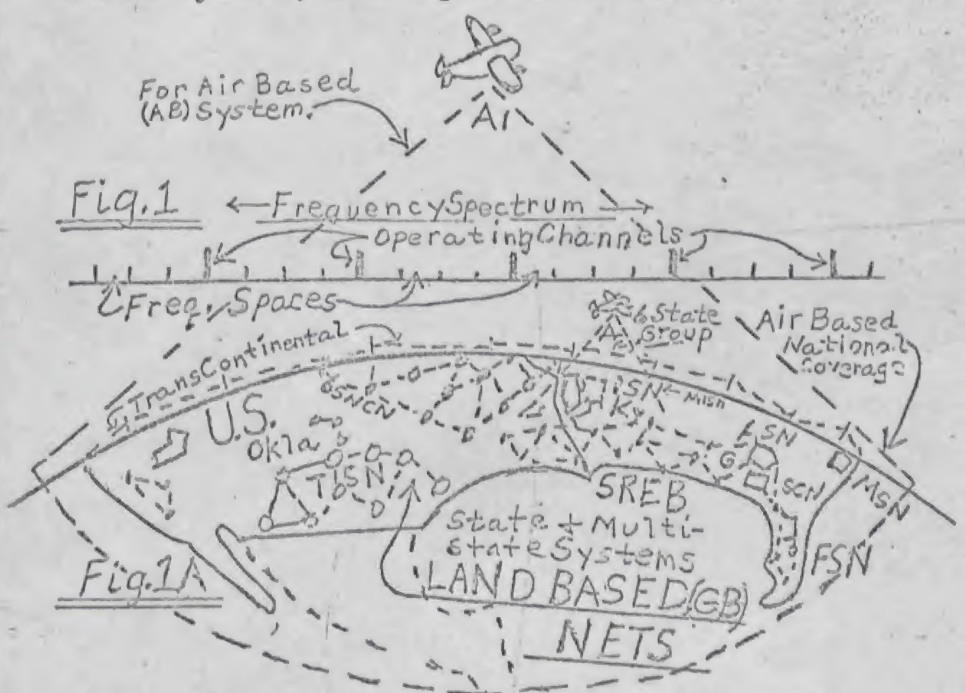

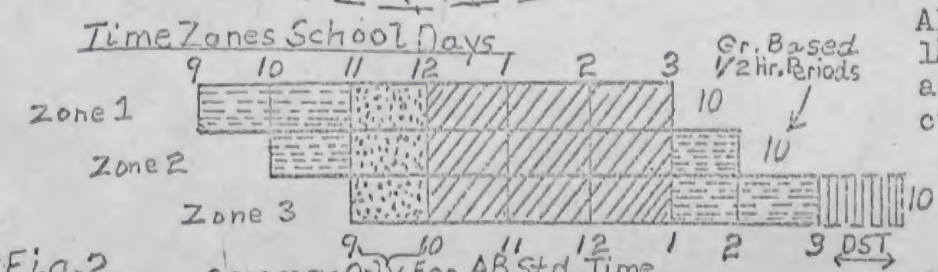

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See TAE032662LM1A Series

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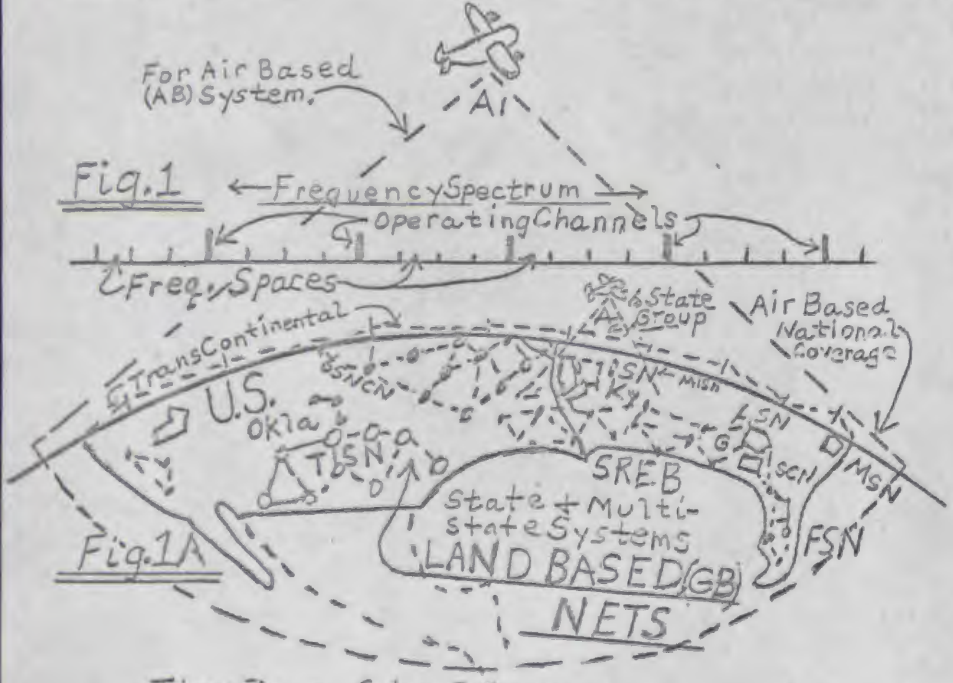

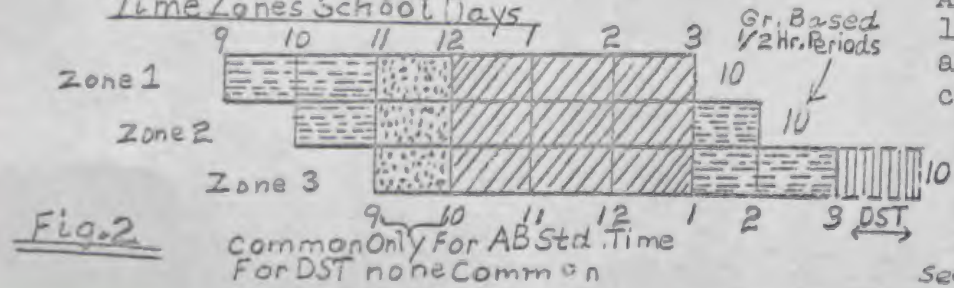

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See TAE032662LM1A Series

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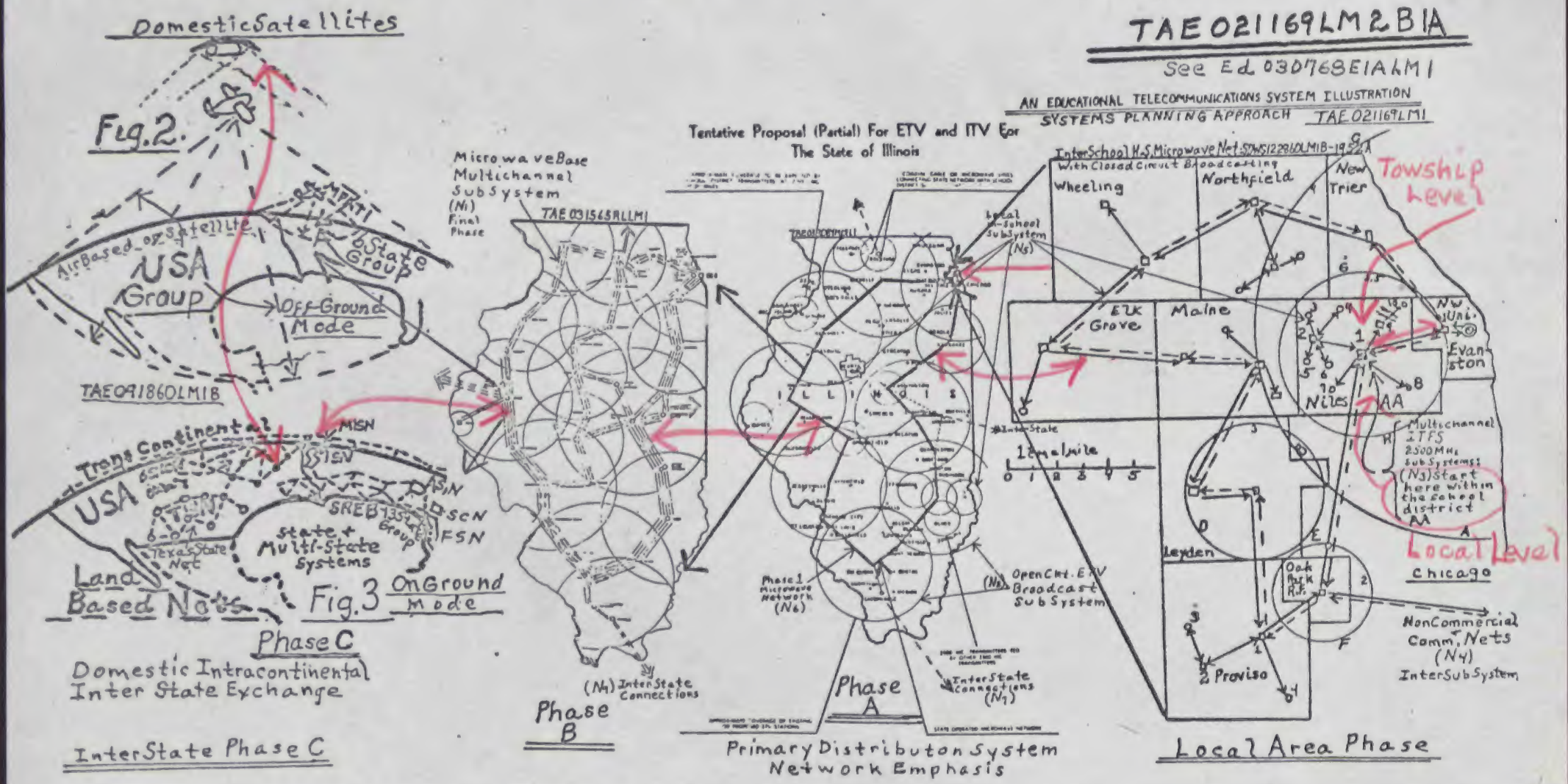
SOME INDICATIONS OF EDUCATIONAL ACTIVITIES, EFFORTS, AND INTERESTS TAE021866LM1-

1.Former univ. staff member; member, Dean Everitt's,Univ.of Ill. Articulation Adv. Committee; Designed/Spec.(1960)Comprehensive Elem. Sch. Prod. & Dist. ETV syste for CBE as pilot for expanding 4 million dollar sys:
2.Mbr. Eisenhower's Little White House Education Conferences; & Co. Comm.:
3.Two terms State Chairman, Ill. Citizens Educ. Council: Mbr. National Committee for the Support of Public Schools:
4.Mbr. two state committees to prepare recommendations for the Ill. Governor's School Problems Commission and State Legislature for a statewide educational communications & T.V. network:
5.Presentation of three independent proposals to the School Problems Commission for inter-government for inter-univ. inter-school systems state operations & educational systems communications network incl. rad. & T.V., Edp, in & out of school education:
6.Life member, National Education Assoc. and state PTA; IEA/NEA centennial citations:
7.Past vice-chairman, Tri County ETV Council and 9 years member of the executive committee:first ETV task comm. chr. Tri Co. Sch. Bd. Assoc. Adv. & Exec. Comm., 1954:
8.Now treasurer, member of exec. comm.(CAST)Chicago Area School TV, Inc.(1/4 milli budgets - 40 ETV Courses to enrolled schools housing 1/3 million students);
9.Past invited speaker to graduate seminar, Temple Univ., twice to Pennsylvania State Schoolmens Week at Univ. of Pa., National School Boards Assn., American Educational Research Assoc., Univ. of Ill., Northern Ill. Univ., Western Ill. Univ Ill. Educ. Assoc., De Paul Univ., Northwestern Univ., Rosary College, Teachers Institutes, etc.;
10.Two terms President, Leyden Assoc. of School Boards(Twp):
11.Six terms and now pres., Elmwood Park, Ill. #85 Board of Education;
12.Fifteen years member, advisory and exec. committee, term V. Chrm., of the Tri County Northern Div. of Ill. Assoc. of School Boards;
13.Member, Nation School Boards Assoc.: State Cooperating Committee "Advisory Committee on Education in Illinois":
14.Member, Exec. Education Coordinating Committee, and Educational Sub Committee, (EIA) Electronics Industries Association(Nat.):
15.Member, State ETV Advisory Committee, Ill. State Office of Public Instruction;
16.Consultations with school architects and school boards in several states on Technological Aids to Education:
17.Illinois Professional Engineer, Member Institute of Electrical and Electronics Engineers (international), Society of Motion Picture and TV Engineers, and other national professional communications and engineering organizations:
18.Participation committees Ill. Commission on Children and Youth,
19.Ed. and Scholarship Comm., Ill. Prof. Eng. Society, Steering Committee Ill. State Consortium study proposals on comprehensive specs. for Elem. Teacher Educati Programs, ETC
20.Member Ill. State Educational Telecommunications Advisory Council.
21.Proponent of much greater coordination and understandings and more common language between Education and Industry/Technology, on more comprehensive educational communications systems operational & R & D evaluation/cooperation.
22.First educational radio broadcasting experience, building and operating, at two universities starting 1926, same for commercial 1928: started Chr. Tri Co. Sch. Bds Assoc. ETV Comm. about 1954 and member since that time.,
23.Univ. of Ill. Master's Thesis work, Staff Member 1928-31; Sigma Xi, Epsilon Chi TV & Radio Eng. 1931-35; Asst. Res. Dir. Motorola Specialties & Communications Div 1940-45; Ch. Eng. Comm.& Elect. Trans. Div. & Systems Eng. Dept. 1945-54; Ch. Eng. Nat'l. Consulting Eng. Services 1950 to date; long participation in professional committee work, local to national level in Education & Communications Eng.

Lloyd P. Morris: 2947 N. 78th Ct., Elmwood Park, Ill. 60635: GL. 3-5781:B '67

ILLUSTRATION OF A SUGGESTED APPROACH TO AN EDUCATIONAL TELECOMMUNICATIONS SYSTEMS TECHNOLOGY ANALYSIS

(See Notes)



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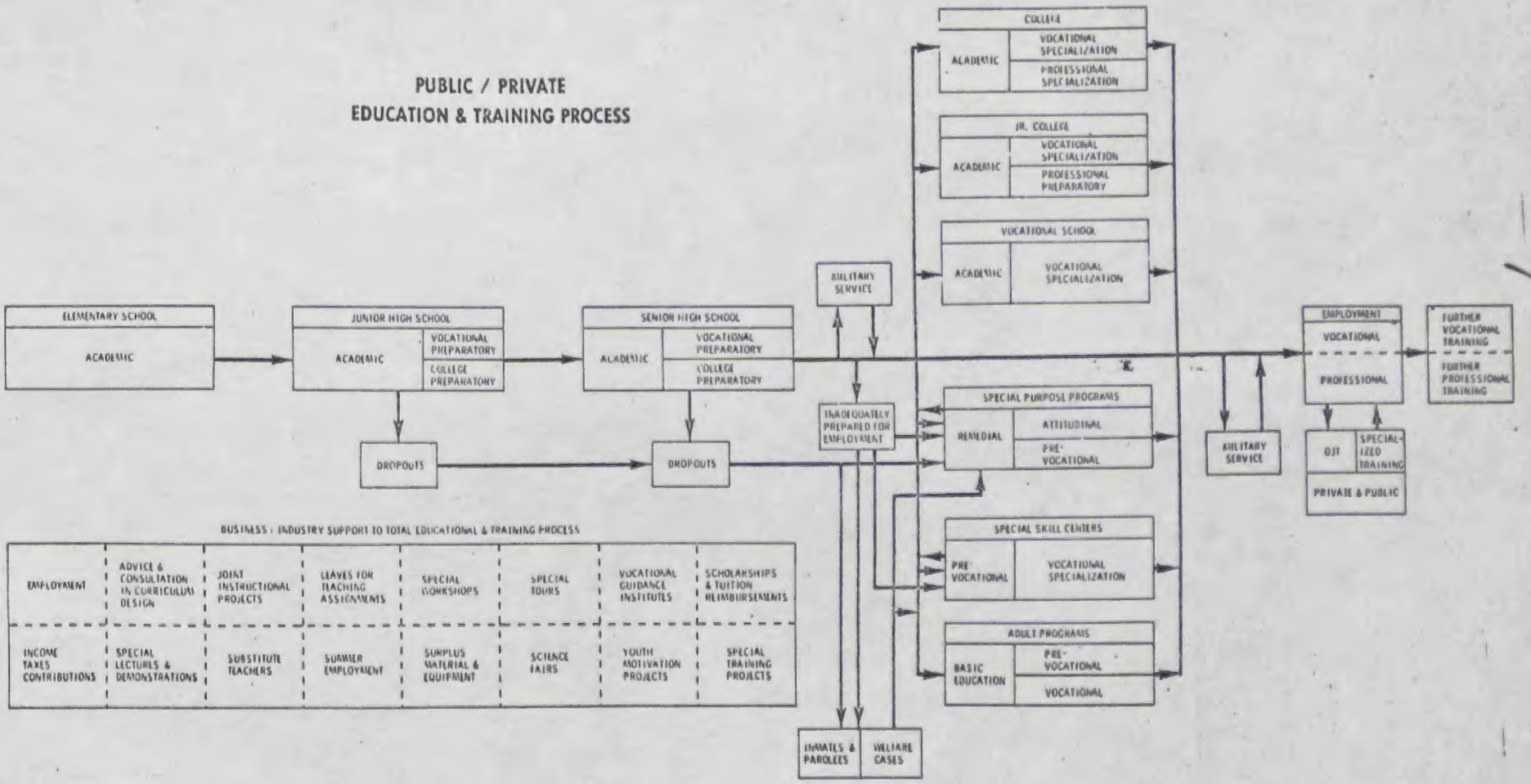

Systems Flow Chart For Education-Business-Industry Study/Action Program

TAE080469LM1

August 4, 1969

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

RE: WHITE HOUSE STUDY OF DOMESTIC INTRACONTINENTAL TELE-COMMUNICATIONS SATELLITE POLICY, AND FURTHER EXCHANGE OF VIEWS ON SAME WITH INTERAGENCY WORKING GROUPS AND CITIZENS.

Dear Sir:

1. Noting in the news that an interagency administration working group was being formed, having had some experience with high level off-ground direct to user telecommunications broadcasting, being a communications systems engineer long associated with conservation of the public domain frequency spectrum and educational broadcasting, and believing a careful communications systems analysis should cover undesirable as well as desirable features, I pass on some comment on the feature or subject of direct domestic telecommunications broadcasting to homes and schools, that has been so much in the news about domestic satellites in the last few years.

A. I am in favor of the domestic intracontinental as well as the intercontinental communications satellite for certain commercial and national security communications, but,

B. Point out that the communications satellite (off-ground distribution) is very inflexible and inefficient in frequency spectrum utilization in the direct to public user mode (homes, schools, etc.), and,

C. Therefore, the direct broadcasting domestic broadcasting communications satellite in a developed country is an undesirable information distribution application.

D. The direct broadcasting mode or application may be a usable one for a temporary system in an underdeveloped country or area, where time will be available for a later economical shift to ground-based broadcasting as high density frequency spectrum usage becomes necessary with the development of that area or country.

E. I suggest that any thorough and viable systems analysis for country or world-wide use of direct satellite broadcasting should bring out this undesirable feature of the communications satellite system. So far as I see, the considerable amount of publicity on the communications satellite, in both the popular and technical press, there has been much emphasis on the domestic intracontinental direct broadcasting mode or application. I suggest further that this confuses too many people, and leads to an erroneous conclusion that we should expend social effort and money on developing the off-ground domestic satellite mode of distributions, and,

F. A careful study of large area, national or international, communications distribution should specifically overcome a widely held misconception that direct satellite broadcasting is a desirable goal in the satellite picture.

2. The Carnegie study, resulting Pastore Senate Hearings, and Public Broadcasting Act, placed great emphasis on the importance to our society of local area entertainment and educational broadcasting diversification development and frequency conservation across the nation.

A. I suggest that a careful communications-social systems analysis will show that the domestic direct broadcasting satellite is in direct opposition to this desired program diversification and frequency spectrum conservation we need in the long run ahead.

B. Therefore, it is suggested that any national level policy consideration, such as I assume from the press your group is to prepare, must carefully study and delineate this particular one of the many communication subsystem modes of communications distribution; showing the undesirable as well as desirable implications for the future. Most of the studies I have seen rather completely ignore this phase of the system (the details of direct domestic satellite broadcasting).

3. Since, from the national level or point of view, we seem, I think rightly, to be looking towards significantly improving quality and quantity aspects of education, since this has long been a special concern of mine along with the pervasiveness of electronic communications in our communications culture (first working in educational broadcasting over 40 years ago), and since this principle of on and off-ground (satellite) broadcasting is probably of high future impact in this application, may I suggest considering a couple of schematic systems illustrations, done for some fellow school board members; illustrations of the importance of more comprehensive system and subsystem considerations.

A. The attached (Item A) Systems Flow Chart for Education - Business - Industry Study/Action Program for Public/Private Education and Training Ed030768EIALM (86M), is an attempt to show the needed comprehensiveness of any good educational telecommunications system technology, to get into this myriad of educational subsystems in the society (an extremely important need).

B. The attached (Item B) "Illustration of a Suggested Approach to an Educational Telecommunications Systems Technology Analysis - TAE021169LM2B1A", illustrates an approach to 'systematize', on one sketch, the breadth or comprehensiveness of a local to world wide communications distribution network, including the communications satellite in both inter and intra continental modes.

This (Item B) world wide communications system (important because your group is to examine domestic satellites) must, I suggest, consider meeting the local intracontinental requirements of (Item A) society's educational as well as other broadcasting needs; the latter and educational sector being illustrated at the right hand side (Local Area Phase) "Niles Township", point "AA", for starting detail.

D. It is important to remember that the (1)"Local Area Phase", (2) "Phase A" primary distribution network, (3) "Phase B" interstate connections, (4) "Phase C" Fig. 1 domestic intracontinental exchange, subsystems are in some places already in existence and formal realities. What remains of the (Item B) total system is to formalize and make practical the satellite phases (inter and intra continental); the subject I believe your group is to consider from the national policy point of view, a subject needing much more careful overall systems analysis.

E. It is obvious, communications systemwise, that one or two way direct broadcasting for local or state use needs be multi-multi channels (combinations of air and cable borne actually) and that moving to off-ground direct broadcasting (domestic satellites) is a move in the wrong direction of less local flexibility and far less frequency spectrum utilization; a very hard cold fact of the present and anticipated state of the electronic communications art - but one that must be dealt with if we are looking for the greatest utilization of the very limited frequency spectrum in a developed country.

F. This is the main thrust of this rather lengthy discussion; the exact opposite of that made so often in both the public and technical press. Many of us are being led astray by continued impressions of the need and so-called advantages of domestic intracontinental Direct Satellite Broadcasting. Nothing could be further from the technological hard cold truth - the facts of electronics communications life are contrary to the generally released publicity and writings about satellites. People and writers too easily become intrigued or mesmerized by continued illusions to the grandeur or glamor of these local "spacious fantasies", and,

G. Unfortunately these facts do not show up in such a system until the duty cycle saturation limit is approached. This is a critical issue; will we start in the proper direction for maximum potential implications, or will we start in a direction (of domestic direct to home and school as an illustration) that will have serious undesirable future implications for serious frequency spectrum saturation limitations in the longer run (a reason I made previous reference to the difference or distinction between the application of direct broadcasting domestic satellites for developed and underdeveloped countries - there are also other significant subsystem features that need careful considerations). Since we have not yet been practically confronted with this limiting condition, too many people involved have ignored it; but finally systemswise it cannot be ignored, unless we are again to be too early confronted with the kind of frequency spectrum limitation crisis we now have in this country in the 2-way mobile commercial and public safety communications services. This is important!

4. Now as to some further and more detailed considerations see the attached (Item C) "Some Air Vs Ground Based Broadcasting Utilization Illustrations - TAE021063LM1" giving some quantative suggestions resulting from hard cold technical limitations. This 021063 illustration is another way of showing the very undesirable frequency spectrum and intertimezone scheduling inefficiencies of the off-ground or satellite broadcasting mode. This principle and showing of off-ground broadcasting system deficiencies has been impacted upon this part of the U.S. for a several year setback and 20 million dollar experimental educational waste in 6 states (see part of Fig. 1 marked in Red - "6 state group"). This is a sad actual example of the thrust I am trying to make. rightly

A. The FCC/denied the expansion of the off-ground distribution system because;

(1) The off-ground broadcasting system would too undesirably disrupt U.S. broadcasting,

(2) This principle or mode of broadcasting is an entirely too inefficient way to use the public domain frequency spectrum,

(3) This mode of broadcasting would not be in the public interest,

(4) etc.

B. This and some other equally undesirable long time implications have been rather completely ignored by too many people considering satellite broadcasting

C. Again, I want to point out that there are some other very beneficial and economical modes of intra and intercontental satellite communications that are very desirable and viable, and needed; but my thrust is we should make much better systems analysis of the whole, and point out the bad features as well as the good, and thus not lead so many astray and wasting of their time and efforts at coming up with undesirable applications - a society's time and money waste that has already happened twice on a big scale - let us not make a 3rd and bigger multi multi million dollar systems error. When these communications and electronics systems directions become so all pervasive and large we can really make some tremendous errors - let us leave the undesirable "Spacious Fantasies" to others with more to lose.

5. For some more specifics on the domestic satellite, see the attached (Item D) "Notes on July 1968 Future Communications Systems via Satellites using lower cost Earth Stations - TAE100368LMA" considering some aspects of a national level EIA sub-committee report to the "President's (Johnson) Telecommunications Task Force on National Communications Policy".

A. Note in particular (marked in red) paragraphs 5B, 6A&B&C, 7, and 8B, with the suggestion and illustrations why such a national policy should include "a caution that intracontinental direct to homes and schools broadcasting satellite, in the public sector, is a very undesirable mode of distribution".

6. Since the U.S. Congress (Public BC Act) as well as national foundation effort have directed and suggested such studies, and another report is to be made to the Congress, "U.S., PBA, Commission on Instructional Technology", I am attaching (Item E) a copy of a June 30 (TAE063069LM1) letter to PBA Title III "U.S. Commission on Instructional Technology" on their study of educational broadcasting, some of the content of which I think is applicable to your group's study; and

A. Because the applications mentioned there are significantly and directly applicable to the domestic satellite off-ground principle of direct communication of nearly all types. The principle is the same in either the public entertainment, public education, or commercial sector of direct to user broadcasting, and

B. Because for too long already this critical factor has been overlooked, and

C. Becuase unsuspecting non-technical people are being and can be misled into wrong social sector decisions or thinking.

7. As a result of being somewhat involved in educational and commercial broadcasting communications systems some 40 years I have formed some, perhaps biased, ideas about this electronic/communications man-machine culture in which we now find ourselves, and hope some of the mistakes of the past may show a better direction for the future; especially where it appears we might be going in the direction of repeating a couple of the bad errors of the past. I must apologize for such a long letter, but since so much is involved, and simple short references did not seem sufficient, it seemed better to be more comprehensive.

I hope these thoughts may be acceptable as a part of the comments the news release indicated you were wanting.

A. As a school board member and communications systems consultant, I have seen and heard hundreds of queries on comments about how great a thing the direct broadcasting satellite will be for homes, schools, etc., and why not just wait until all these great things will be coming direct to us from the sky - the glamor spacious fantasy approach. So many have gotten an incorrect impression of the direct Satellite broadcasting mode, that it seems time for someone with good exposure to point out the vast subsystem differences in the several distribution modes; especially the one discussed above. The technological implications information needs more dissemination into the non-technical social sectors. The glamor of these space age times may lead to too much intoxication with the exuberance of the verbosity of fictional reporting on some of these matters, leading some of us into more spacious fantasies, unlimited by such hard cold facts as practicality, cost, efficient use of our communications frequency spectrum, and overall systems feasibility.

8. If there are any reports or releases available bearing on your committees, assignments, goals, directions or works so far, I would much appreciate hearing of same. Thank you.

Yours very truly,

Lloyd P. Morris

Lloyd P. Morris
2947 North 78th Court
Elmwood Park, Illinois 60635

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Enclosures

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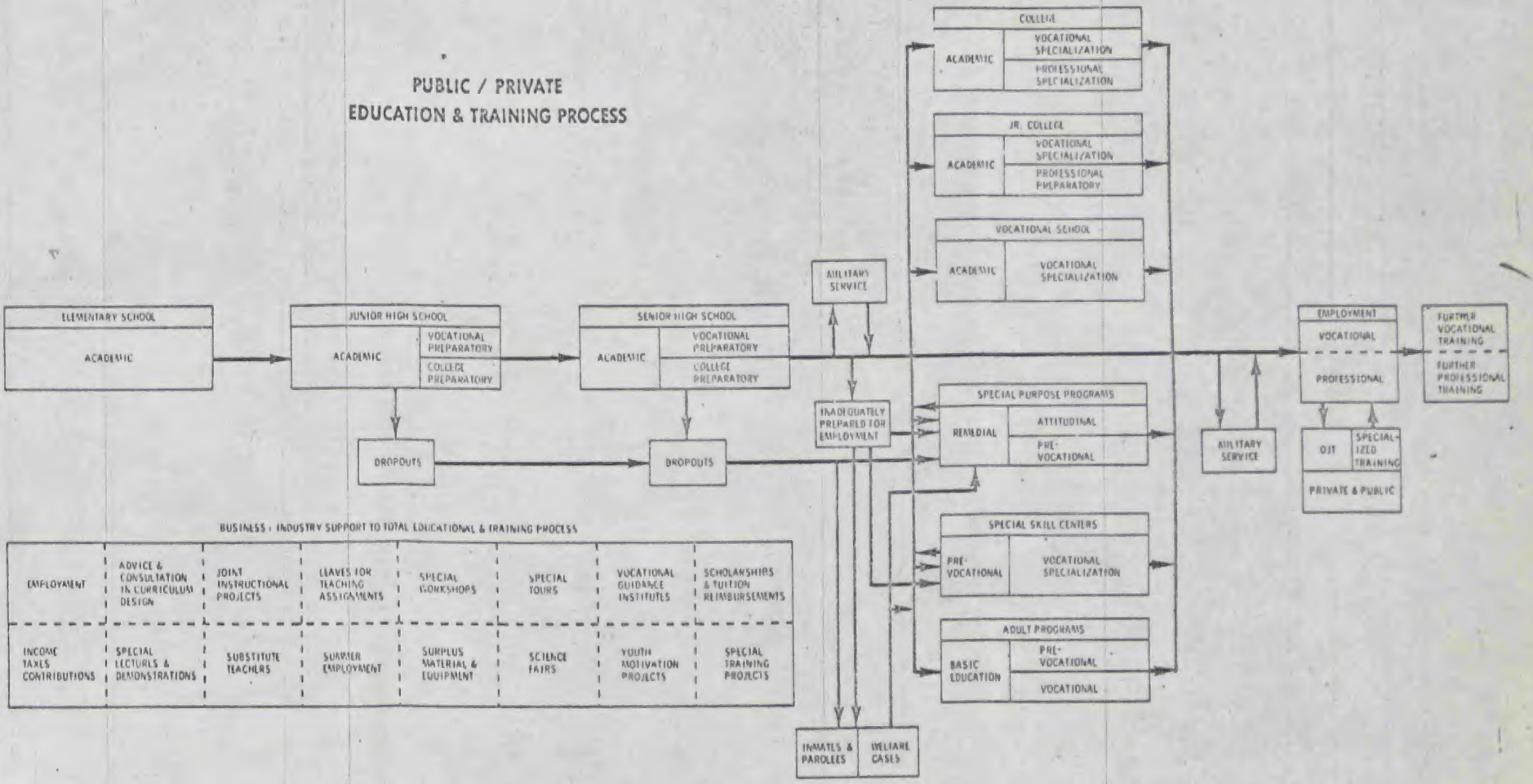

Systems Flow Chart For Education-Business-Industry Study/Action Program

17

ILLUSTRATION OF A SUGGESTED APPROACH TO AN EDUCATIONAL TELECOMMUNICATIONS SYSTEMS TECHNOLOGY ANALYSIS

(See Notes)

B

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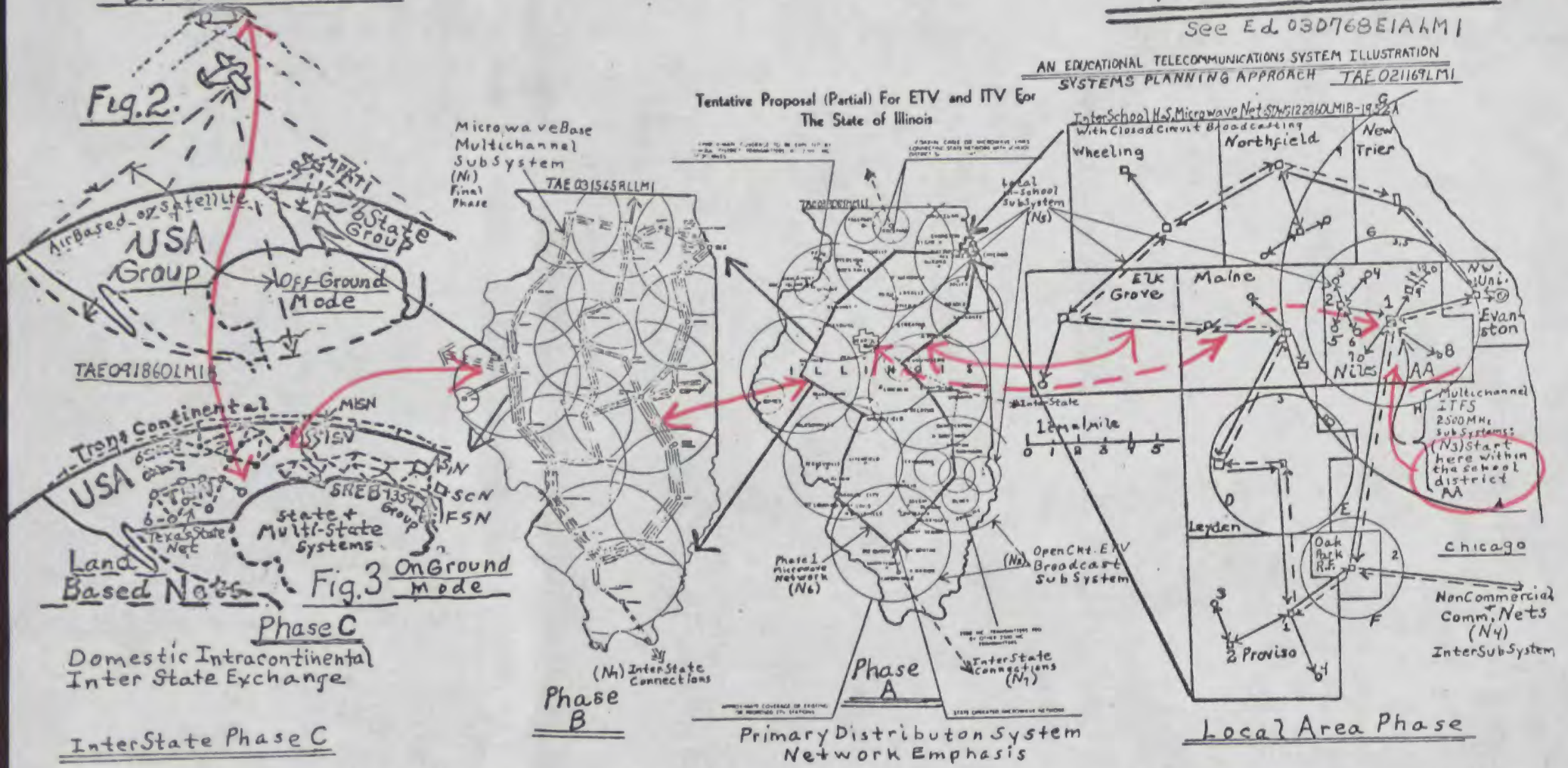

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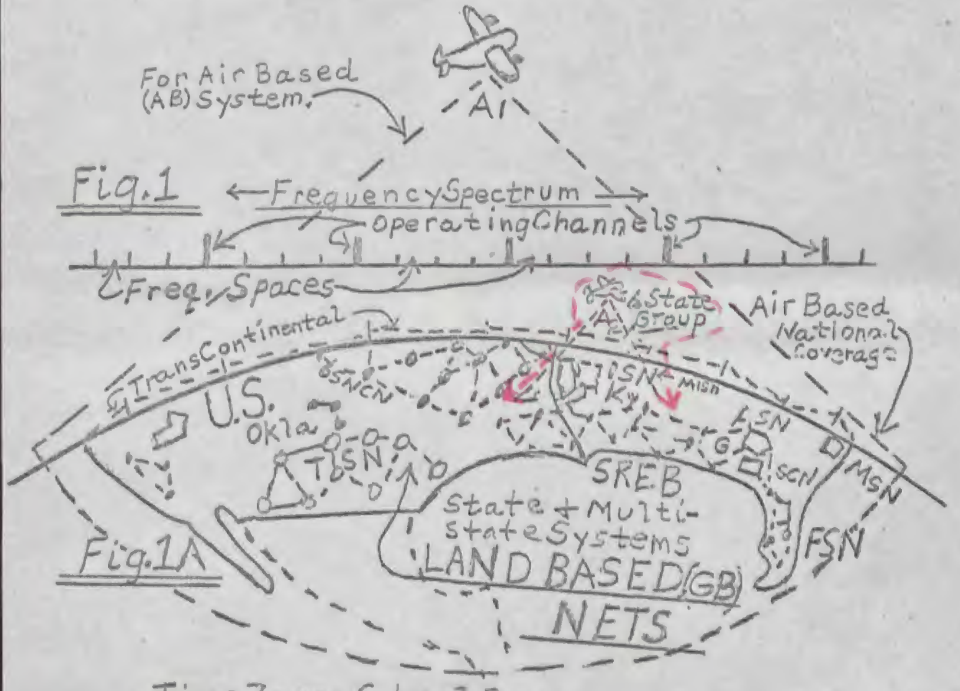

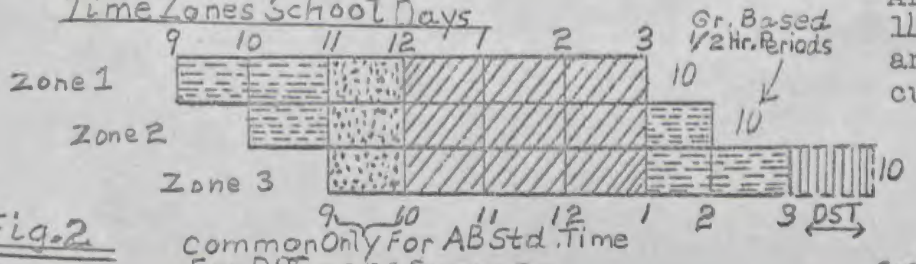

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See TAE032662LM1A Series

(D)

TAE100368LM1-A

NOTES ON JULY, 1968 REPORT "FUTURE COMMUNICATIONS SYSTEMS VIA SATELLITES USING LOW COST EARTH STATIONS"

(Satellite Telecommunications Subdivision - Industrial Electronic Div. EIA)
Following are: A) A severe summary of the Satellite proposal,
B) Comments on the inappropriatness of believing the Satellite makes a good direct to home or school distribution system, and on spectrum utilization.

1. This industry oriented 160 page ad hoc study and follow up, on an EIA 1967 Special Seminar, on some of the engineering, policy, and international aspects of the intra-continental domestic satellite telecommunications system is an endeavor to report to the President's Telecommunications Task Force.

A. With a conclusion that satellite transmission powers and antenna gains can be boosted sufficiently to provide satisfactory direct service to much lower cost earth/ground stations in the 1970's.

2. A suggestion is that many much smaller non-tracking non-automated earth antenna/receiving stations can be used, if gains are boosted at other places in the system, and if bandwidths (number of orbital channels) are reduced, to appreciably reduce the total collective systems cost and to arrive at the hundreds of thousands of dollars per ground station point in the 1970's.

3. Many theory, cost, quality trade offs, and frequency variations for major elements of the system are indicated; a major point being the significant total reduction in system and channel time costs, if trade off costs can be shifted from many ground stations to other parts of the intra-continental domestic system; looking toward elimination of earth based large costly steerable antennas, cryogenically cooled amplifiers, etc. This study envisions, for example, reducing currently required 100' earth antennas to 30 and 50' diameters.

4. Some of the report terms, like (EIRP) (eff. isotropic RP) or (G/T) (gain temperature ratios) or (SCC/FM) (Single ch. carrier freq. mod) or (HPA) (hi. power amp.), VSAM, MDC, FDMFM, etc., are not separately listed, and therefore, sometimes a bit elusive unless very close attention is given by the reader. On the other hand, there are many charts, tables, and diagrams used to aid in getting a fairly comprehensive sub-systems view of this picture and approach being recommended.

5. This report is well worth studying, if for no more than a good exercise in systems technology design factors and presentation. It also suggests a per channel cost reduction from $30,000. to $3,000. as a possibility in the 1970's.

A. Because of the national attention on the social importance of communications and good frequency spectrum utilization practices, it seems appropriate to dwell on this in some detail here following. In addition,
B. This report, and others easily lead people and writers to conclude that the Satellite is the answer for direct to user home and school broadcasting. A contention here in these notes is that there should be emphasis that this is not a good distribution mode or use for Satellites in developed and densely popuplated countries or where spectrum space is at a premium.

6. This report, along with others on satellites, seem to rather completely neglect: (1.) A very important point about frequency spectrum utilization for the off-ground direct intra-continental domesting broadcasting communications distribution mode/principle; (2.) The vast differences and direct conflicts of inter vs. intra contintental broadcasting; (3.) The significant social/intergovernmental application and conflicts between the remote (social space) controlled non-diversification inter-continental, and the locally controlled widely diversified intra-continental modes/principle of information distributio (4) The very inefficient frequency spectrum space utilization factor for the off-ground vs. the on-ground application, when the off-ground use usurps/pre-empts the many many hundreds or thousands of times that same one channel could be used across the country; (5.) The terribly inefficient inter-time-zone interference utilization (where for 3/4 of North and South America for example, in a six hour day, not one single time zone band is common with any other in any one half hour period); (6.) A specific delineation of these conflicts in the different applications, for the benefit of those involved in the different services; etc; points urged for consideration as top priorities in such a conference for two years before the seminar was called.

A. In connection with these last two points, and as an example of importance, a three year study and public hearings by the F.C.C., on a petition, docket 15201, to regularize off-ground direct domestic broadcasting in the UHF spectrum, resulted in a denial by the F.C.C. with the conclusion that this principle or mode of communications would be:

1.) Too great a disruption of the United States commercial broadcasting industry;

2.) An inefficient use of the direct broadcasting frequency spectrum;

3.) Would not be in the best public interest; etc. etc.

In addition a three year three million dollar joint experiment (armed services, aircraft company, F.C.C., industry) twenty years ago, proved the direct off-ground broadcasting principle/mode so obsolete then that not one single such commercial system was ever licensed or put into service since that time. Some years ago, this observer made a study using F.C.C. Eng. report 5.2.2 and studies in Europe that showed how six nation wide operating UHF-BC channels would usurp/pre-empt over 3,000 independent simultaneous applications in the same frequency block in the ground based mode. In addition, the message duty cycle limitations of the off-ground system are impossible, when compared to what can be done in the ground based mode for Public,Safety,Comm. services, etc., on the same channel spac

B. In this observers opinion, when one considers the very undesired, and some think crippling, lack of sufficient domestic commercial, general public, and educational channels in the near future, a failure to consider these serious long time inefficiencies, and their implications, we are making a gross error. Such implications should be of first importance in any thinking in such a report to be considered at top national level. It is suggested here that only when all the system factors are reported

can we really make the sound communications systems judgements for such momentous implications for the future, nation wide.

C. These considerations are doubly important because this EIA report dwells at some length especially on direct to home and local area broadcasts.

1.) This observer suggests again that this off-ground direct local area broadcasting distribution mode is about the worst and most inefficient technological and spectrum approach that we could devise for this application of direct broadcasting to individual users.

2.) And in addition, it is suggested that it is just as bad from a moral and social control point of view; the kind of obsolute remote control that Hitler and Stalin could have dreamed about (because the remote controlled air based off-ground transmitter/antenna usurps/pre-empts the multiple repeated local controlled broadcasting on the same channel in the potential ground based mode.).

D. Please note that these above comments do not apply, and are not so intended, for the case of the inter-continental, national security, and certain commercial aspects of the satellite communications situation; a point that seems to continually be lost sight of in the tremendous pressures and publicity concerning some of these "Spacious Fantasies" in communications systems considerations. It is suggested that in some of these cases, these soft ware considerations are far more important than the hardware problems. Why get excited about a hard ware problem that is not applicable in the longer pull ahead; for direct to user distribution?

E. These remarks are not to say that this EIA report is not worth very careful study in the proper context; and one that is not mentioned in the report. The Ford, Carnegie, and other reports, and probably the direction so far evident in the President's Task Force Study sub. Comm. all seem to overlook this situation, in direct broadcasting.

7. When the above deficiencies are considered then this EIA satellite report is well worth more careful study from the total communications and social systems point of view. The total system economic consideration is still an important point of view, even in the more commercial primary distribution area and zone distribution mode, because the public taxpayers have to pay the final price anyway. The public probably has a more important stake in the public domain direct broadcasting frequency spectrum utilization and usurpation/pre-emption point of view, however. These are important considerations in this complex society where the costs of societal control might be growing beyond available public resources and support; a case where the soft ware aspects of the system maybe more important than the hardware aspects. It is to be hoped that the President's Task Force on Communications will not overlook these problems, and will emphasize sub-sys problems so that the non-technical will not be led to think that domestic intra-continental direct broadcasting satellites are a good answer to local communication needs!

8. It is realized that severely limited comments or evaluation suffer potential misinterpretation; and criticism of same is welcomed. Such comments do, however, seem in order since this report was tendered in support of national communications policy, and as such should, in this observers opinion, cover a much wider range of systems considerations.

A. It is recognized also that in certain special short time cases such as in undeveloped countries, special emergencies, cases of large scale reorientation, or where the frequency spectrum will not be congested for many years and/or the off-ground system can be moved out before the frequency spectrum is loaded, then a short time off-ground or Satellite direct broadcasting system may be justified.

B. However, it must be remembered that in the U.S. and other developed countries people should be cautioned that intracontinental direct to homes and schools broadcasting satellite, in the public sector, is a very undesirable mode of distribution.

Lloyd P. Morris
2947 North 78th Court
Elmwood Park, Ill. 60635

TAE063069LM1 (E)

June 30, 1969

Commission on Instructional Technology
Mr. Sidney Tickton, Exec. Dir. of Studies
Title 3 National Educational Technology Study
1424 - 16th Street N.W. - SUITE 203
Washington, D.C. 20036

RE: NATIONAL EDUCATIONAL TECHNOLOGY STUDY

Dear Sir:

1. A suggestion has been that I send you some items, done for fellow school board members, as an indication of what a school board member (one of those fellows who is charged with some of the public education policy making, but who is all too often consulted last or not at all about school problems and directions) thinks about some of the oncoming educational telecommunications systems technology needs and problems.

2. By way of introduction I believe I have had the good fortune to have had lunch with you a couple times at EIA and NSBA committee meetings back when you were with the Ford Foundation. My first exposures to educational broadcasting at a couple universities over 40 years ago, 2 decades of school board work, over a decade as a school board assoc. representative (now member Executive Committee and Treasurer) to an ETV project now grown (without government or Foundation aid) to 48 teacher selected courses on 2 channels delivered to voluntary enrolled schools housing over 1/3 million pupils at about 6 cents per course, per pupil, per year, and working with some schools in this 4-state area on new media problems, results in my having some in-school biased orientations about these matters. See TAE021866LM1B listing of activities and interests in education, if you may be further interested in my in-school biases and efforts for education.

3. Now, as to some general comments on the educational telecommunications systems technology picture, see the following:

A. Letter TAE100868LM1 to Senator Yarborough passing along some thoughts of a school board member, and far thinking on his Ed. Tech. Act 1968 Bill now in Congress.(8).

B. TAE042169LM1 is a similar thing - to Rep. John Brademas re: The Ed. Tech. Act of 1969 (HR-8838). (The above A & B items do not include their original attachments). (4)

C. "Major Issues Study Report" draft comments TAE012969LM1, set out some thoughts on some elements of the future for Education and Training - as a part of a national level Ed. Coord. Comm. for the Electronics Industries Association. (25)

D. Some "Notes on a Comprehensive Educational Telecommunications Systems Technology - TAE 051169LM1" comment on the need for more general systems analysis in the educational picture, and show some systems flochart illustrations. I think this brings up some very important considerations. (22)

E. "Preliminary System Study Notes.....TAE041263LM5" illustrates an example of some of the many systems analysis failures creeping into

the educational media systems planning in these times. (6). Many government and non-government pressures have not been sufficiently longer time in-school systems oriented and considered; to the extent that many actually restricted and reduced potential improvement aid to in-school education.

F. Notes TAE100368LM-A on an EIA Industry Committee report on domestic satellites (made to the Pres. Task Force on Communications Policy) is self-explanatory, in showing why the direct to home and school broadcasting satellite is a very bad idea from the long pull in-school ETV or Radio spectrum space utilization point of view. I contend this is a serious situation. (4)

G. "Pres. Panel would smash AT&T Common Carrier Monopoly - TAE013069LM2", and its pg. 3, represents another one of the many, many educational communications problems that are critical in these times. (3)

H. FCC Docket 18346 (TAE102468LM1) on a phase of the in-school educational telecommunications picture, just illustrates another one of these several things being done by government, and/or recommended by associations or Foundations, that make the lot of the in-school people more and more difficult all the time; and maybe writing off effective viable in-school ETV. With such restrictions it is somewhat doubtful that boards of education should put significant resources behind ITFS (2500M.Hz). Regular broadcast ETV is a worse situation. (3)

J. Notes on "International Standardization of Ed. and Training Equipment - TAE042869LM2" is another example of a real need that will probably not be satisfied or seriously considered until too late to do the most good. (6)

K. TAE041769LM Letter to Hawker Siddeley, GB, illustrates some more serious problems that need more attention. (4).

L. Letter TAE041069LM (4/9/69) is one of several to the Ford Foundation on what a school board member feels about some future and current educational technology problems. Too many in-school and out-of-school people do not talk a common understanding language on what ought to be carefully set out systems situations. (8)

4. I believe there is a big and serious gap in needed growth and improvement rates in the educational government, social, and economic sectors of the social order, because technology and education do not talk the same language and understandings to a sufficient degree. In fact, I suggest that each is actually and significantly delaying the growth of the other, because of failure to come to reasonable systems analysis and understanding of potentials and directions.

5. All too often Government, Foundations, Associations, and others, take directions that seem to them, as out-of-school oriented and experienced elements, to be right; but actually are detrimental to the in-school sector growth and effectiveness gains. This is all too often quite serious. Some of the attached items speak to this point.

6. In spite of some Ford Foundation report and other conclusions that ETV had really made little or no impression on U.S. education, I would suggest that this depends upon the kind of ETV being considered, and for what purpose, and suggest also that the correct ETV mode of lesson and knowledge distribution the in-school potential of this technological aid could be tremendously and perhaps revolutionarily significant.

A. The trouble has been that the Ford Foundation, Government, Associations, NAEB and the like have pressured the out-of-school community cultural broadcasting mode of distribution, already too limited in number of spectrum channels (only 1 or 2, when dozens were needed). I contend this is the wrong distribution mode for direct distribution broadcasting (and the domestic satellite is even worse, and subject for a separate discussion).

B. We could not expect our school board policy decisions to embrace this kind of ETV when it could not do the longer time viable in-school in-class workhorse job; and so these channels lay fallow educationwise so many years. They still are not really applicable except under certain conditions where there is sufficient money base for their use just to allow teachers, school boards, and citizens to get enough experience exposure so when a real ETV distribution mode comes along (something like 2-way 2 block ITFS) we will be better ready to go.

C. I think it is easy to show that the pressures of government programs like the ETV Facilities Act, much of the Ford Foundation pressures, NAEB, and others, on the out-of-school ETV broadcasting mode, actually in the long run diluted, deleted, dalayed, mitigated against and contributed to in-school staff resistance to ETV (as they understood ETV from these experiences with the wrong kind of ETV). If these in-school people and school boards could have had an equal experience with a viable in-school ETV mode they would have drawn entirely different conclusions.

D. Now if the same pressures, support, and resources, could be applied to a good in-school mode of ETV distribution (not CCETV) I believe we would see a revolution in improvement in the in-school sector of U.S. education. What we really needed was to have recognized the differences between the several modes of ETV distribution and picked the right one. Instead, we continued to use and deplete in-school resources to support and enforce an undesirable and inefficent out-of-school ETV mode on the in-school sector. Our school boards and in-school people could not have been expected to make it work; and therefore, the conclusion that this kind of ETV has not been a significant factor for in-school education. It could never be, and I suggest that a careful educational telecommunications technology systems analysis would show this to be the case. If we are to have success we must quit looking at the wrong kind of ETV for the in-school sector.,

E. Again, if we would have put the same effort and support behind the proper in-school ETV distribution mode (as suggested by the 030768 and 021169 sketches attached), that we did over the last two decades put into the wrong kind of out-of-school ETV we would have, I suggest, seen a beneficial improvement revolution in education. In-school education (which is 2-way communications) has long needed improved telecommunications within the system, but we actually have prevented real improvement in this sector for years. We needed the pressures on the in-school distribution mode; not on the out-of-school broadcast mode.

7. As one of several serious examples of what happened, consider the ETV Facilities Act. It made many millions available for the out-of-school broadcasting mode of ETV; but prohibited aid for school boards who wanted and needed the in-school mode. Several districts considered suing HEW because of this discrimination of giving aid to out-of-school ETV, while prohibiting aid for in-school ETV; but concluded that in the face of tremendous pressures and publicity for the out-of-school ETV

broadcast mode, and resulting mind-set, such effort would be useless.

A. And, the Ford Foundation, NAEB, Government and some association pressures, along with failure to mount any high level systems study or cross understandings between the out-of-school and in-school sectors, in effect, aided and abetted the blind plunge in the wrong direction, from an in-school point of view; and further depletion of in-school resources resulted, that might otherwise have been behind a more viable ETV distribution mode.

B. A viable in-school ETV distribution mode or system, just like in the case of the out-of-school broadcast mode, is too costly to get a good start from available in-school resources (along with legal and political prohibitions, and resistance to change in use of public tax dollars, against such experiments by school boards). The in-school mode needs outside seed money even worse than the out-of-school ETV broadcast ETV sector (and I have been involved in both starting 40 years ago in two university broadcasting radio situations), if we are to lead or show a better way by example.

8. Now another one of many examples of this kind of trend circumstance against a good in-school ETV direction. The PBA title, under which I believe you are working, said in effect, let us work for a nation wide instructional T.V. research investigation study for the in-school sector. This was good, since Carnegie, Ford, USOE had all neglected this sector.

A. What happened? As I see the picture so far from the in-school point of view, this act was rather completely distorted into an instructional technology study instead with out-of-school slanting; and,

B. Again an abortion of a good educational telecommunications (ETV) in-school technology systems analysis and study; a continuation of neglect of the in-school ETV sector; because of pressures, orientations, or control by out-of-school experienced people; and again failure of the in and out-of-school people to sufficiently talk one another's language and understandings.

9. Now as to a couple suggestions, in addition to reversing the negatives pointed out above; I suggest more serious consideration of:

A. Reversing the procedures of the past, and put behind a viable in-school ETV the equivalent attention, resources, pressures, and understandings, that have been put behind the out-of-school ETV broadcast mode in the past;

B. Really make a comprehensive study and educational telecommunications technology systems analysis involving the in-school sector in American education (deleting the potent out-of-school ETV broadcasting decision influences), (as I think the PBA title intended). (This would continue study of the multi-channel low power ITFS in-school mode of distribution started by the FCC, but so far severely restricted by lack of application support resources and understandings).

C. Set up a complete large area in-school educational telecommunication systems technology operating exploratory example (in magnitude, equivalent to what has been applied to the out-of-school ETV broadcasting sector in the past), involving and specifically designed for the in-school sector.

D. Provide some means and studies whereby government and other pressures/influences can get their mind set off broadcast ETV and onto the in-school ETV need and potential;

E. And, many others that go with the above.

F. Please do not get the idea I am against a good study of instructional systems technology. We do need it, as a separate direction, not on the Title III in-school ETV base. We also need out-of-school ETV broadcasting but not in the in-school sector.

10. I must apologize for the length of this letter, but we have neglected the in-school system so long, and the need is so critical, that more details or comments become necessary to cover my thoughts. I would be glad to hear your reaction to the above, and when your studies are completed and report available.

Thank you.

Yours very truly,

Lloyd P. Morris

Lloyd P. Morris
2947 North 78th Court
Elmwood Park, Illinois 60635

LPM:es
Enclosures

P.S. Letter typed and mailed in Mr. Morris' absence (on vacation) - hoping to have conveyed his intentions.

Eveline J. Sliwa

Eveline J. Sliwa, secretary

File Copy

SOME INDICATIONS OF EDUCATIONAL ACTIVITIES, EFFORTS, AND INTERESTS TAE021866LM1B

1.Former univ. staff member; member, Dean Everitt's,Univ.of Ill. Articulation Adv. Committee; Designed/Spec.(1960)Comprehensive Elem. Sch. Prod. & Dist. ETV syste for CBE as pilot for expanding 4 million dollar sys:
2.Mbr. Eisenhower's Little White House Education Conferences; & Co. Comm.:
3.Two terms State Chairman, Ill. Citizens Educ. Council: Mbr. National Committee for the Support of Public Schools:
4.Mbr. two state committees to prepare recommendations for the Ill. Governor's School Problems Commission and State Legislature for a statewide educational communications & T.V. network:
5.Presentation of three independent proposals to the School Problems Commission for inter-government for inter-univ. inter-school systems state operations & educational systems communications network incl. rad. & T.V., Edp, in & out of school education:
6.Life member, National Education Assoc. and state PTA; IEA/NEA centennial citations:
7.Past vice-chairman, Tri County ETV Council and 9 years member of the executive committee:first ETV task comm. chr. Tri Co. Sch. Bd. Assoc. Adv. & Exec. Comm., 1954:
8.Now treasurer, member of exec. comm.(CAST)Chicago Area School TV, Inc.(1/4 millio budgets - 40 ETV Courses to enrolled schools housing 1/3 million students);
9.Past invited speaker to graduate seminar, Temple Univ., twice to Pennsylvania State Schoolmens Week at Univ. of Pa., National School Boards Assn., American Educational Research Assoc., Univ. of Ill., Northern Ill. Univ., Western Ill. Univ. Ill. Educ. Assoc., De Paul Univ., Northwestern Univ., Rosary College, Teachers Institutes, etc.;
10.Two terms President, Leyden Assoc. of School Boards(Twp):
11.Six terms and now pres., Elmwood Park, Ill. #85 Board of Education;
12.Fifteen years member, advisory and exec. committee, term V. Chrm., of the Tri County Northern Div. of Ill. Assoc. of School Boards;
13.Member, Nation School Boards Assoc.: State Cooperating Committee "Advisory Committee on Education in Illinois":
14.Member, Exec. Education Coordinating Committee, and Educational Sub Committee, (EIA) Electronics Industries Association(Nat.):
15.Member, State ETV Advisory Committee, Ill. State Office of Public Instruction;
16.Consultations with school architects and school boards in several states on Technological Aids to Education:
17.Illinois Professional Engineer, Member Institute of Electrical and Electronics Engineers (international), Society of Motion Picture and TV Engineers, and other national professional communications and engineering organizations:
18.Participation committees Ill. Commission on Children and Youth,
19.Ed. and Scholarship Comm., Ill. Prof. Eng. Society, Steering Committee Ill. State Consortium study proposals on comprehensive specs. for Elem. Teacher Educati Programs, ETC
20.Member Ill. State Educational Telecommunications Advisory Council.
21.Proponent of much greater coordination and understandings and more common language between Education and Industry/Technology, on more comprehensive educational communications systems operational & R & D evaluation/cooperation.
22.First educational radio broadcasting experience, building and operating, at two universities starting 1926, same for commercial 1928: started Chr. Tri Co. Sch. Bds Assoc. ETV Comm. about 1954 and member since that time.

Lloyd P. Morris: 2947 N. 78th Ct., Elmwood Park, Ill. 60635: GL. 3-5781:B '67

Lloyd P. Morris
2947 North 78th Court
Elmwood Park, Ill. 60635

CHICAGO, ILL. 14
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AG 8 9V

PRINTED ~~MATTER~~ & 1 FIRST CLASS

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

Previous request – attached

see attached

WSK 1/7/16

Will

List people who have indicated desire to come in.

MEMORANDUM

THE WHITE HOUSE

WASHINGTON

October 16, 1969

FOR Clay T. Whitehead

FROM Richard Gabel

SUBJECT Domestic Satellite Responses

The following organizations have requested an audience to discuss further their responses to your letter of August 19, 1969:

Maximum Service Telecasters

COMSAT

Other respondents volunteered to furnish further comments or enter into further discussion, if you find it necessary. Replies of this kind include the following:

Ford Foundation

Western Union

ITT World Communications

General Electric

Corporation for Public Broadcasting

association of
MAXIMUM SERVICE TELECASTERS / INC.

1735 DeSales St., N.W.
Washington, D. C. 20036
DIstrict 7-5412

Lester W. Lindow, *Executive Director*

October 10, 1969

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

Dear Dr. Whitehead:

The attached Comments concerning the development of communications technology and services and their regulations were filed with the Federal Communications Commission on September 5, 1969. This paper highlights some of the profound policy aspects of the "wired nation" concept. I hope that this information will be useful to your task force on domestic satellites.

Representatives of this Association would welcome the opportunity to meet with you for discussion of the issues involved in your current study.

Sincerely,

Roy W. Easley
Assistant Executive Director

kf

Enclosure

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

In the Matter of

Amendment of Part 74, Subpart K. of the Commission's Rules and Regulations Relative to Community Antenna Television Systems; and Inquiry into the Development of Communications Technology and Services to Formulate Regulatory Policy and Rulemaking and/or Legislative Proposals.	DOCKET NO. 18397

COMMENTS OF THE ASSOCIATION OF MAXIMUM SERVICE TELECASTERS, INC., ON PART V (GENERAL AREAS OF INQUIRY)

The following comments are submitted by the Association of Maximum Service Telecasters, Inc. (MST), in response to Part V of the Commission's December 13, 1968 Notice. As to some of the questions posed in Part V, e.g., technical standards for multi-purpose wire communications, MST takes no position at this time. As to others, e.g., nature of services to home or business, MST awaits with curiosity the responses of other parties to learn about "checkless" checks, paperless "newspapers," and at home shopping "trips." However, there is a series of inter-related questions and issues upon which MST will comment at this time -- these concern the place of the free, local television broadcast station, advertiser supported or educational, in the home communication system of future decades. Simply stated, MST opposes any substitution or phasing out of the free, local television broadcast station in favor of a multichannel, wire grid system, interconnected by terrestrial microwaves or space satellites into a "wired nation."

A. CATV Is A Detour On The Road To The Wired Nation.

Over the past two years, since proposals for a "wired city" first came to light,[1] broadcasters have watched with increasing alarm as the momentum for the wired city or wired nation concept grew among some large CATV interests and others of a more academic caste. The convergence of forces in favor of the wired nation is, perhaps, best illustrated by the Commission's own Part V inquiry, which seems to view CATV, albeit in expanded form, as a logical step in the direction of the wired nation. But is it and should it be? Technically, there is reason to believe that the coaxial cable used for CATV would not be adaptable to the two-way transmissions and switched exchanges that some see as the sine qua non of the wired nation. (See, e.g., ADA Comments on Part V, p.8, June 5, 1969). While the allegation has been made that CATV cable systems could be converted for two-way transmissions, there is no technical evidence to support this view. There is considerable doubt that even the most up to date CATV equipment demonstrated at NCTA's June 1969 convention is capable of satisfactorily providing two-way operations on as few as three or four television channels.[2] Even if there were a way to allow for CATV conversion to two-way operations there is every reason to believe that the costs would be enormous -- certainly not commensurate with the likely benefits. Moreover, given the propensities of the typical woman shopper, it is extremely doubtful that there would ever be sufficient cable bandwidth

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1/ See, e.g., Barnett & Greenberg, A Proposal For Wired City Television, 1968, Wash. U.L.Q.1 (Winter, 1968).

2/ See Switzer, "1969 Trade Show Review," TV Communications p. 75 (August 1969).

or switching capacity available in a system to make it feasible for hundreds or thousands of women to select their new Fall wardrobes by using wired television channels. Even if the technical obstacles could be surmounted, it would be fundamentally unfair to make broadcasters, like condemned men who have to supply the hanging rope, participate in their own destruction by allowing CATV operators to use free broadcast signals as the economic base for the wired nation, which would have no room for television broadcast stations once the objective was achieved.

Operating on the principle that no one ever went broke promising program diversity to the FCC, CATV interests have taken up the academics' cry of service to"minority taste" audiences. Discounting such foot in the door appeals, it is clear that creation of a multichannel technical capacity, even on present-day cable systems, does not and will not create significantly more diverse or higher quality television programming and that the probable result would be loss to the public of the free over-the-air service it now receives in abundance. Like the promises of the over-the-air pay TV proponents before them, CATV operators may promise culture and special interest programming, but they have their eyes on broad-appeal entertainment programming, where, free from the public service responsibilities of broadcast television licensees, the greatest subscriber and advertiser revenues lie. The CATV operators now moving into program originations may talk about channels devoted to city council meetings, high school drama, cameras focussed on weather instruments and news wire teletypes, but most look to films and other entertainment programming as their contribution to "diversity." This sounds like wired pay TV, because it is. Explaining the "diversity concept"

in the July 1969 issue of BM/E (Broadcast Management/Engineering), one CATV operator stated that the four channels of non-broadcast programming he expects to market to CATV systems throughout the United States "to be paid for by subscribers rather than by local advertisers." Even if direct program charges are not imposed on subscribers, the subscriber could end up paying for non-broadcast program channels on CATV either by charges per channel, or special service charges, or through increased subscription charges. As another CATV operator stated,

> "It's not always the smart thing to go to the local municipality that granted the franchise and ask for a fee hike. Such tactics always leave a bad taste. But it's quite another thing to ask for a rate increase when it's sought on the basis of increased investment and additional service." (BM/E (Broadcast Management and Engineering), July 1969, p.56)

No matter how the subscriber pays for the programming, it is pay TV for, as the Commission has recognized, "pay TV" does not necessarily mean that charges will be imposed only on a per program basis.

Until recently, the sources for such "diverse" programming have been free-film sponsors, syndicators of "baby sitting" cartoon shows and some film packagers. At present, CATV systems are moving into direct competition with television broadcasters for the most attractive feature film and sports programming packages. For example, GenCoE has made arrangements with Warner Brothers-Seven Arts for a film package which "represents 40 percent of the released films between 1950-1964 . . . the same that are now being released to commercial television."[1/] CATV for August 11, 1969 (p.16) reports that Cable Channels Inc., has an exclusive contract from NFL-AFL Films for the NFL's 1965-66, 203 film "Game of the Week" package. The report concludes by stating that

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1/ CATV, p.8, July 28, 1969.

"with professional sports becoming higher and higher priced, and television increasingly hesitant to pay the prices the pro leagues demand, cable may wind up with a share of the action at some time in the future." Manhattan Cable Television Company has the rights to carry 125 Madison Square Garden sports events (pro hockey, basketball and boxing) during the 1969-70 season.[1/]

Later, with the profits derived from subscribers and advertisers -- since program sponsorship by national and local business is another source of present and future CATV revenue -- CATV operators on the road to the wired nation would syphon programs and talent now available free of charge on broadcast television. Thus, the adverse impact of CATV's importation of distant television broadcast signals would be accelerated by direct syphoning of free television's programs and talent. Instead of specialized programs for minority taste audiences, the public would end up paying dearly for the same type of program fare to which they now have access merely for the price of a second-hand television receiver.

Beyond programming, some believe that CATV could also serve as the foundation for initiation of services to the home such as information retrieval, data processing, banking and shopping by wire, etc. However, even one of the originators of the wired city concept -- Dr. Edward Greenberg of Washington University (St. Louis, Mo.) -- assessing the future economic outlook for cable television at the June 1969 NCTA Convention expressed skepticism about

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1/ The Evening Star (Washington, D.C.) p.E-2, May 21, 1969. For other examples of CATV program originations see MST's Comments (April 3, 1969) and Reply Comments (May 12, 1969) on Part III Paragraphs 11-20, 23-25 of the Notice in Docket No. 18397.

CATV's potential for developing "non-television" services. (See NCTA Membership Bulletin, July 1, 1969, p.6).

B. The Road to the Wired Nation is Also the Road to the Destruction of Free, Local Television Broadcast Stations and Would Raise Serious Social and Economic Problems.

There are proponents of the wire concept who believe that a multichannel, wired city system, interconnected on a nationwide basis, would be economically, socially and politically more desirable than our present mixed communication system of telephone and microwave common carriers, television broadcast stations and CATV. There is, however, no reason to believe that the universal wired communications system they envision could be realistically implemented in a way to provide significantly more, more diverse or better program service than we now have, even if such a system might allow us to shop, bank, and work at home! In terms of the critical information and entertainment functions of our communication system, the evidence points to the conclusion that the wired nation would destroy the free, local television broadcast station as it has developed over the years and, with it, the immense values served by our present mode of television broadcasting.

1. Television broadcasting provides enormous benefits to the American public.

Our present television broadcast system serves enormous social and economic values. While there is some hesitation about placing a dollar figure on these values and the benefits derived from television broadcasting, one way of coming to grips with this task was developed by Robert R. Nathan Associates, Inc., in a report entitled "The Social and Economic Benefits of Television Broadcasting," which was submitted to the Commission as Exhibit No. 6 to MST's April 30, 1969, Reply Comments in Dockets Nos. 18261 and 18262.

Nathan's economic studies showed that the dollar value of the benefits provided to the American television viewing public by commercial and educational television programming amounts to over $100 billion annually and this is without regard to the additional enormous contributions that television broadcasting makes to society and the further enormous contribution that television broadcast advertising makes to national business productivity and economic activity.

2. Adverse impact upon free, local television broadcast stations.

The adverse impact upon the public interest in television broadcast stations and the values they serve is one of the most serious problems associated with the wired nation. Once a multichannel wire system is established it would destroy the local television broadcast station by a combination of a loss of network, syndicated and other nonlocal program services and extensive audience fragmentation, which would destroy financial support for local program services. Given the severe audience fragmentation and high cost per thousand caused by a multichannel wire system, it is extremely unlikely that sufficient advertising support could exist for the maximum number of "national commercial networks" contemplated in wired city proposals. There might be some increase in viewing, but there would be small audiences for each "network." Advertising revenue for each "network" would be reduced, while program costs continued to climb.

A major source of programming, audience and revenue for local television stations would be lost in a wired system, when network and other nonlocal program services could be provided directly to the home viewer.

If local, advertiser-supported television station entities continued to provide local program services on a

wired system, they would have to do so without network programming, without attractive films and syndicated program materials and without adequate advertising support, which would result from the great audience fragmentation caused by a multichannel wire system. Once the entertainment and sports nucleus of a local television broadcast station's program service is lost to the wired system or adversely impaired by it, the next block of programs that would be lost would be the commercially unattractive public service and public affairs programs, since stations presently use the funds derived from the sale of commercial time in other programming to "subsidize" the public service programs and other programming intended for specialized audiences.

The loss of news programming would be most severe, since this is often the most expensive portion of the local television broadcast station's local program service. Even though local news programs are usually attractive to sponsors, the revenues derived from the sale of time in local newscasts is usually not enough to cover the cost of producing and broadcasting the news programs, or, at best, to permit the station to break even on its news operations. In many communities the only actively competitive local news organizations are the news departments of the various local, commercial television broadcast stations. Given the dwindling number of competitive local, daily newspapers, it is reasonable to expect that many communities that now have multiple television broadcast service, and hence competitive broadcast news service, would end up with none in a wired system or would have no more than one localized television news entity. There is also a question as to whether the quality, scope and depth of television news could be maintained. There is even less likelihood that present television broadcast public service and public affairs

wired system, they would have to do so without network programming, without attractive films and syndicated program materials and without adequate advertising support, which would result from the great audience fragmentation caused by a multichannel wire system. Once the entertainment and sports nucleus of a local television broadcast station's program service is lost to the wired system or adversely impaired by it, the next block of programs that would be lost would be the commercially unattractive public service and public affairs programs, since stations presently use the funds derived from the sale of commercial time in other programming to "subsidize" the public service programs and other programming intended for specialized audiences.

The loss of news programming would be most severe, since this is often the most expensive portion of the local television broadcast station's local program service. Even though local news programs are usually attractive to sponsors, the revenues derived from the sale of time in local newscasts is usually not enough to cover the cost of producing and broadcasting the news programs, or, at best, to permit the station to break even on its news operations. In many communities the only actively competitive local news organizations are the news departments of the various local, commercial television broadcast stations. Given the dwindling number of competitive local, daily newspapers, it is reasonable to expect that many communities that now have multiple television broadcast service, and hence competitive broadcast news service, would end up with none in a wired system or would have no more than one localized television news entity. There is also a question as to whether the quality, scope and depth of television news could be maintained. There is even less likelihood that present television broadcast public service and public affairs

programming would be sustained in a wired system. In short, rather than expanded news, informational and public service programs the end result of the wired city and nation may be to diminish or preclude the full availability of such programming. Such a development would rightly be viewed with considerable alarm.

Permitting "tests of different systems or services by different entities," as suggested by the Commission in Part V, question 3(b),would not afford any basis for determining the extent of adverse impact on television broadcast stations which would result from the wired nation. The difference between the effects shown by such experiments and the impact of a fully operational wired nation is a difference of kind not of degree.

Perhaps Commissioner Kenneth Cox put the potential adverse impact of a wired nation best in a perceptive speech to the Wisconsin Broadcasters Association on January 30, 1968, when he stated:

> " . . . I must confess that one of my main concerns with this whole concept is about its impact on local broadcast programming. While I have been known to be critical of the local live offerings -- or lack thereof -- of certain stations, I believe strongly in a diversely owned, locally based broadcast system, both to insure diversity of viewpoints and to provide the base for a service emphasizing local news, local weather, local religion, local issues, local charitable organizations, and local programming tastes. . . . I don't mean to imply that our system is sacrosanct and should not be modified. But I do think there are real values in our system which should be preserved if at all possible, and that we should be sure that proposed change will really produce a better service before we embrace it. As I have suggested, I think there are serious problems in the proposal for wired television which its supporters have not thought through. And I am concerned that even if we can gain some of the promised benefits of such a system, we may lose other values in the process.

3. Implementation of the wired nation concept would lead to enormous concentration and centralization of

control over communications facilities to the detriment of the public.

The ultimate effect of a multichannel wired system would be an extensive concentration of ownership and control in the provision of television service to the public; with this concentration would come a greatly increased amount of governmental control, especially since it is likely that a common carrier would operate the wired facilities and it would be subject to strict government regulation. If such regulation were effective, it could work to stifle free expression. If it were not effective, the public would be at the mercy of the operators of the wired system. The "big brother" potentiality of a wired system must be contrasted to the real values derived from a diversely-owned, locally-based free television broadcast structure with its principal emphasis on localism.

With such a universal, nationwide wired system, the Commission may be deceiving itself by posing a question concerning the "division of regulatory functions between federal and state or local authorities. . . ." (Part V, question 10). The unprecedented concentration that would result from the fully interconnected wired nation would most likely lead to a substantial loss of state and local control.

While some see a nationwide wired television system, subject to regulation as a common carrier and involving unlimited access of program-supplying entities to the common carrier channels, as an enhancement of free speech opportunities, it would not likely work out this way. The wired nation would destroy the present locus of responsibility for programming now lodged in the licensee of the local television broadcasting station. Exercise of this responsibility operates to expand the access of varying views to the broadcast channel. The point is that a combination of

economics, technology and legal and social responsibilities has shaped the local television broadcast station as a unique entity organized to serve local and area needs and to reflect local community values by providing comprehensive, well-rounded program services to all the people free of charge. It is extremely doubtful that the unique entity that is the local television broadcast station, and the values it serves, could be preserved or recreated if a wire grid were to replace the present television broadcast system.

4. Under the wired nation concept of providing television program service, the poor and rural residents would be deprived of benefits they now receive free of charge, absent subsidization by the federal government.

NCTA frankly admits that problems such as service to the urban and rural poor and service to residents of sparsely populated areas, regardless of their ability to pay have not been solved. (NCTA Comments of May 12, 1969, pp. 14-19.) With respect to service to the poor, NCTA pointed to the welfare field for possible solutions, stating that the gain in social benefits may justify subsidies in order to allow the poor to subscribe to wired television. A subsidy is also proposed as a possible solution to the problem of service to rural areas, i.e., through a type of Rural "Wired Television" Administration. However, given present national priorities for the expenditure of public funds, it would be most unwise to invite further government subsidies to provide wired television to those who could not otherwise avoid it. Without subsidies, reliance upon the wired nation as a means of providing television programming would mean a withdrawal of service from those segments of the population who rely most heavily on free television service as their principle means of entertainment, news, information and culture.

To summarize MST's position, whatever arrangements are ultimately made for providing the non-television programming services that some look to from the wired nation, the Commission should assure that no step is taken that would jeopardize the provision of television program service to the American people by free, locally oriented television broadcast stations. Once destroyed, our present system -- which offers and provides so much to so many -- would be virtually impossible to recreate in the wired nation.

Respectfully submitted,

ASSOCIATION OF MAXIMUM
SERVICE TELECASTERS, INC.

By /s/ Ernest W. Jennes
ERNEST W. JENNES

By /s/ Henry Goldberg
HENRY GOLDBERG

Covington & Burling
888 Sixteenth Street, N.W.
Washington, D.C. 20006

Attorneys for
Association of Maximum
Service Telecasters, Inc.

September 5, 1969

September 5, 1969

To: Mr. Roy Easley

From: Eva Daughtrey
Tom Whitehead's office

Mr. Whitehead asked me to send you a copy of the letter and attachment which you requested.

No decision has been reached yet as to whether or not meetings will be held with interested parties to discuss these matters -- but we will be in touch.

Attachment

Friday 9/5/69

9:25 Had a call from

Roy Easley
Assistant Executive Director
Maximum Service Telecasters
1735 DeSales Street, N. W.
Washington, D. C. 20036

DI. 7-5412

It is an association of approximately 160 TV stations all over the country. Indicated that in an article in this week's Broadcasting Magazine, mention was made that the Task Force was looking into domestic satellite field and had sent letters to industry, etc., attaching a set of issues.

He said his association has been very heavily involved in all the spectrum allocation in management matters and a heavy participant with the FCC in all phases including CATV regulation, manned mobile radio, etc.

Would like very much to have a copy of the letter and issues. Also wondered if they might be able to meet with you to discuss the matters.

COVINGTON & BURLING
888 SIXTEENTH STREET, N.W.
WASHINGTON, D.C. 20006

TELEPHONE
(202) 293-3300

TELETYPE: (202) 965-0673
CABLE: COVLING

Dr. Clay T. Whitehead
Staff Assistant
Room 110
Executive Office Building
Washington, D.C.

August 5, 1969

Dear Mr. Whitehead:

In accordance with our telephone conversation today, I enclose herewith a statement filed by the CBS Television Network Affiliates Association in the FCC's domestic communications satellite proceeding (Docket No. 16495). Also enclosed herewith is a letter to the FCC concerning a proposal of the CBS Television Affiliates Association for expansion of the COMSAT pilot plan for domestic satellite system to include television broadcast station ownership of one or more of the 30 receive-only ground relay stations that would be used in the pilot plan to provide interconnection services to television broadcast stations.

I think you will find that the enclosed materials show the CBS Television Affiliates Association to have a great interest in the matter of domestic communications satellites and in experimental programs involving such satellites. Because of the Association's interest, representatives of the Association were invited to participate in a NASA-sponsored discussion concerning the availability of its Applications Technology Satellites for experimental uses. Since participating in this discussion, which was held in June, the Affiliates Association has maintained a continuing interest in the matter. It is for this reason that the Association will follow the work of the White House's working group which is to consider the provisions for introducing communications satellites into the domestic communications system. You indicated in our telephone conversation that a representative of the CBS Television Affiliates Association could have the opportunity of meeting with you and discussing certain of the pertinent matters concerning

domestic satellites. I expect that Mr. A. James Ebel, who is Chairman of the Satellite Communications Committee of the CBS Television Affiliates Association, would be able to meet with you for this purpose some time within the next two or three weeks. If this is convenient for you, I would appreciate it if you would contact me and advise me of a day and time for such a meeting.

Thank you very much for your consideration in this matter. I look forward to hearing from you.

Sincerely yours,

Henry Goldberg

Henry Goldberg

Attorney for
CBS Television Network Affiliates Association

cc: Mr. A. James Ebel

Enclosures
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BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

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

STATEMENT OF CBS TELEVISION
NETWORK AFFILIATES ASSOCIATION

1. The CBS Television Network Affiliates Association (hereafter "CBS TV Affiliates"), an association of the affiliates of the CBS Television Network other than those owned by CBS, hereby files this Statement to place the views of its members before the Commission in the above-captioned proceeding. This is the first opportunity that the CBS TV Affiliates have had to file in Docket No. 16495, since it was not until the June 1967 Annual CBS TV Affiliates meeting that a position on certain of the matters in issue in this proceeding could be adopted, after which this filing was authorized.

2. Various parties to this proceeding have expressed differing views as to the type of system for domestic satellite communications which should be authorized by the Commission. The CBS TV Affiliates take no position on this question, but rather wish to urge that, irrespective of the type of system ultimately chosen, broadcast stations be allowed, individually or in groups, to own the ground receiving equipment necessary to provide television interconnection service to them by satellite.

3. The CBS TV Affiliates submit that permitting broadcast stations to own the satellite receiving facilities necessary for service to them is the most practicable way of assuring that the individual users of the satellite service directly receive the economic and technological benefits that would result from satellite interconnection. The broadcast stations would be able to participate meaningfully in such a system. The estimated costs of equipment for receive-only ground terminals are relatively low; estimates in this proceeding have ranged from $40,000 to $100,000 for mass-produced equipment. Moreover, the technological skill necessary to operate and maintain the ground receivers is surely within the capacity of the typical broadcast station. Indeed, the 73 ground receivers in the Bell System's proposal would be designed for unattended operation.

4. A review of the comments and proposals filed in this Docket shows that, with very few exceptions, the requisite ground receivers could be located at, or no more than one microwave hop from, existing television broadcast station sites. In very populous areas, where frequency congestion may present a danger of harmful interference to present terrestrial microwave systems, or where it is not feasible for all stations in a multi-station market to own separate ground receivers, there could be joint ownership and use of ground receiving stations by the broadcast stations in the area. Broadcast stations often join

together to make use of tall towers. Similar arrangements could be made for joint ownership and use of ground receivers. The Commission's recently-adopted rules on antenna farms (Report and Order in Docket No. 16030, FCC 67-703 (June 16, 1967)) might add impetus to the joint use of ground receiver locations that are mutually convenient to broadcast stations in populous metropolitan areas. Location of the ground receiver segment of the satellite system at existing television broadcast station sites is logical in terms of economy, technology and ease of operation. It would reduce the costs of interconnecting receiving terminals and television stations. It would also increase the quality of telecasts, especially color telecasts, by reducing signal degradation caused by phase distortion when the signal is amplified and relayed by microwave hops. A substantial number of earth receiving locations would be immediately available at substantial savings, that is without the costs and delays resulting from land acquisition and zoning considerations. This would mean that the public would derive immediate benefit from the advanced satellite technology. The broadcast stations would also have direct control over the receiving facilities and could establish their own priorities for the repair and maintenance of the equipment. It would also foster competition among equipment suppliers, who must develop equipment for the facilities of many different users, in keeping with the policy of Section 102(c)(1) of the Communications Satellite Act of 1962. (47 U.S.C. § 721(c)(1) (1964))

5. Allowing broadcast stations to own and operate their own ground receiving terminals would also give the stations greater flexibility in providing service to their local communities. The same considerations that prompted the Commission to authorize individual stations to own and operate microwave facilities as Intercity Relay Stations support the authorization of station ownership of satellite ground receiving terminals. (See Television Intercity Relay Stations, 17 R.R. 1621 (1958)) Direct use of the satellite system by broadcast stations is a logical extension of the Commission's ruling on Intercity Relay Stations, since the same benefits to be derived from station-owned microwaves could be achieved more effectively and more efficiently with station-owned satellite receiving terminals. Station ownership of ground receivers would allow television stations affiliated with national networks inexpensive and efficient access to network programming; would give affiliated and unaffiliated stations greater flexibility in forming ad hoc local and regional distribution systems for locally and area-originated, as well as syndicated programming, and would also facilitate the creation and use of new commercial or noncommercial network organizations by reducing the costs of interconnection.

6. A point of fundamental importance is that station ownership of ground receiving terminals is a matter of economic necessity for smaller stations

serving less populous areas of the country. It is not convenient or economically practicable for terrestrial common carriers to provide interconnection to stations in such markets. For example, under the Bell System's proposal, filed in this Docket, none of the projected 73 ground receiving terminals would be located in five sparsely-settled western states -- states that are not presently interconnected by terrestrial facilities.[1/] The noninterconnected stations in these areas must construct and operate their own intercity microwave facilities or rely upon inefficient off-the-air pickups for network service and remote pickups. Satellite interconnection of stations in these areas would be especially beneficial and relatively inexpensive, since the costs of such a system are not a function of the distances involved in relaying television signals. The rates of the satellite interconnection system could be established on a per channel basis rather than on the mileage basis presently used. Unless broadcast stations in less populous areas are allowed to own and operate their own ground receiving terminals, they would be denied the full advantages of the one interconnection system that is ideal for the conditions they face in these areas. One immediate benefit to be derived by stations in these smaller markets would be

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1/ Similarly, COMSAT's pilot demonstration proposal, filed in this Docket, provides for only 30 "receive-only" ground stations for all of the states located in the Pacific and Rocky Mountain time zones.

more feasible and inexpensive use of remote pickups, most likely in conjunction with other stations in the area.

7. Failure of the Commission to allow for station ownership and control of ground receiving terminals would reduce the incentive on the part of the station to make full use of the benefits of satellite technology and would encourage the maintenance of the present terrestrial distribution system, with its attendant disadvantages. The Commission should not, as a matter of law or policy, preclude any television station or stations, either individually or jointly, from owning the ground receiving equipment necessary to provide television interconnection service to them by satellite. The Commission should, as it has in the past, accommodate mixed-ownership systems in order to encourage the larger and more effective use of radio facilities. It should not foreclose the possibility that broadcast stations in certain localities might prefer to own ground receiving terminals with which they may directly obtain programming from diverse sources rather than deal through the intermediary of a common carrier (See Allocation of Microwave Frequencies Above 890 Mc, 27 F.C.C. 359 (1959)), especially since it now appears that the common carriers do not plan to provide an adequate pattern of satellite interconnection service to such stations. The Commission has no obligation to protect the economic interests of the common carriers to the detriment of the public interest. (Id. at 412)

Moreover, as the record in this proceeding shows, station-owned ground receiving terminals would not cause excessive harmful interference to common carrier terrestrial microwave systems. Station-owned ground receivers could be used in conjunction with common carrier-owned satellite and ground facilities. The carriers have long been able to interconnect with facilities owned by others without technical difficulty. Allowing station-owned ground receiving terminals would follow logically from established Commission policy concerning private microwave systems and broadcaster-owned and operated Television Intercity Relay Stations, (See Allocation of Microwave Frequencies Above 890 Mc, 27 F.C.C. 359 (1959); Television Intercity Relay Stations, 17 R.R. 1621 (1958)) and with developing congressional policy. (See S.1160, 90th Cong., 1st Sess. § 201(6) (1967))

Respectfully submitted,

CBS TELEVISION NETWORK
AFFILIATES ASSOCIATION

By /s/ Ernest W. Jennes
ERNEST W. JENNES

By /s/ Henry Goldberg
HENRY GOLDBERG

Covington & Burling
701 Union Trust Building
Washington, D.C. 20005

Attorneys for
CBS Television Network
Affiliates Association

July 21, 1967

DISTRIBUTION

A copy of the foregoing STATEMENT OF THE CBS TELEVISION NETWORK AFFILIATES ASSOCIATION has been distributed on this date by first-class mail to parties who are recorded by the Commission as having filed a pleading in Docket No. 16495.

/s/ Henry Goldberg
HENRY GOLDBERG

July 21, 1967

KOLN-TV
CORNHUSKER TELEVISION CORPORATION
CHANNEL 10
CHANNEL 11
KGIN-TV
TELEPHONE 434-8251 · 40TH & W STREETS · LINCOLN, NEBRASKA · 68501

OFFICIAL SEAL OF
NEBRASKA'S CEN
1867-1967
ONE HUNDRED YEARS
OF PROGRESS

June 17, 1968.

Mr. Ben F. Waple, Secretary
Federal Communications Commission
Washington, D. C. 20554

RE: DOCKET No. 16495

Dear Mr. Waple:

Enclosed herewith are copies of an exchange of correspondence between the undersigned, dated April 16, 1968, and the Communications Satellite Corporation (COMSAT), dated May 20, 1968. The correspondence deals with a proposal of the CBS Television Affiliates Association for expansion of the COMSAT pilot proposal for a domestic satellite system to include television station ownership, either individually or jointly, of one or more of the 30 receive-only ground relay stations that would be used to provide interconnection services to television broadcast stations.

The details of the Affiliates' proposal are spelled out in my letter dated April 16, 1968. The essence of the proposal is that a period of testing and experimentation has been requested by COMSAT and the CBS Television Affiliates believe that such a test program would be desirable. The Affiliates believe, however, that it would be valuable to make the test more comprehensive by providing for television broadcast station ownership of at least one of the receive-only ground relay stations that would be used to provide interconnection services to television stations.

In its filing in Docket No. 16495 on July 21, 1967, the CBS Affiliates urged the authorization of television station ownership of such receive-only ground stations in the domestic satellite system ultimately selected by the Commission. At various times during the past six months we have held informal discussions with COMSAT in order to have COMSAT broaden its proposed pilot program to include television station ownership participation during the proposed period of experimentation. The enclosed correspondence reflects the point the discussions have now reached. It is submitted for inclusion in the docket file in the light of paragraph 5 of the Notice of Inquiry in Docket No. 16495 (FCC 66-207) in which the Commission expressed an interest in having before it all information relevant to the matters to be resolved in Docket No. 16495.

Respectfully submitted,

A. James Ebel

A. James Ebel
Vice President and General Manager

enclosures -

K O L N - T V
CHANNEL 10
CORNHUSKER TELEVISION CORPORATION
CHANNEL 11
K G I N - T V
TELEPHONE 434-8251 · 40TH & W STREETS · LINCOLN, NEBRASKA · 68501

OFFICIAL SEAL OF
NEBRASKA'S CENTENNIAL
1867-1967
ONE HUNDRED YEARS
OF PROGRESS

April 16, 1968

Major General George P.Sampson
Vice President, Operations
C O M S A T
1900 L Street, N. W.
Washington, D. C. 20036

Dear General Sampson:

Please consider this letter a summary of the matters Mr. Goldberg and I discussed with you at your office on January 16, 1968, and with you and Mr. Acheson on March 20, 1968.

As I pointed out when we met, the CBS Television Network Affiliates Association is an association of the television broadcast stations affiliated with the CBS Television Network, other than the stations owned and operated by CBS. Through its Satellite Communications Committee, our organization has studied the development of communications satellites with great interest. We believe that communications satellites have an important role to play in enabling television broadcast stations to provide service to the American public more effectively by facilitating the interconnection of television stations.

As the CBS Television Affiliates stated in its filing in the domestic satellite proceeding (Docket No. 16495), whether the satellite system ultimately chosen by the Federal Communications Commission is a multipurpose system or one dedicated to television usage, television broadcast stations should be allowed, either individually or in groups, to own the receive-only ground equipment necessary to provide television interconnection service to them by communications satellites. Station ownership of receive-only ground stations would allow television stations affiliated with national, commercial and educational networks inexpensive and efficient access to network programming, would give all stations greater flexibility in forming ad hoc local and regional distribution systems for locally and area originated and syndicated programming, and would facilitate the creation and use of new national, commercial and educational network organizations by reducing the costs of interconnection. Station ownership of ground receiving terminals is especially important for smaller stations serving less populous areas of the country. Such stations are, for the most part, not provided with interconnection service by terrestrial common

carriers. The noninterconnected stations in these areas must construct and operate their own intercity microwave facilities or rely upon inefficient or inadequate off-the-air pickup for network service and remote pickups. As you know, satellite interconnection may well be the most efficient means of serving television stations located in sparsely populated areas of the country.

Since the CBS Television Affiliates support a mixed ownership system in providing television interconnection service by satellites, we were most gratified to see that COMSAT, in expanding its proposal for a pilot demonstration program, recognized the possibility of "an interim arrangement for divided ownership of earth station facilities" during the course of the pilot demonstration program (COMSAT Response to the FCC, dated July 26, 1967, pp. 38-41) .

It is with this background that the CBS Television Affiliates Association proposes a mixed ownership plan that is much more limited than that referred to by COMSAT in that it covers only the receive-only ground stations to be used to provide interconnection service to television broadcast stations. It is our intention to have this mixed ownership plan tested, with FCC approval, during the course of the COMSAT pilot demonstration program. Under this proposal, a number of television stations in the Mountain or Pacific time zones, or both, would jointly own and operate at least one of the 30 receive-only ground stations, which are proposed as part of the COMSAT pilot demonstration program.

We hope that COMSAT would have no objection to such a plan, since we feel that it is quite reasonable and would offer a number of advantages that would have the effect of making the pilot demonstration program more comprehensive but would not burden COMSAT in having to deal with many diverse users in conducting the pilot program. In terms of finances and engineering, operation of a receive-only station is well within the capabilities of a typical television broadcast station. The service to be provided by the receive-only stations would be an important service, as evidenced by the fact that COMSAT proposes to devote all 30 receive-only ground stations to television distribution and not to other possible uses. Television broadcast station ownership of the television relay earth terminals would be completely consistent with past practice in the provision of television distribution services, in that television broadcast station ownership of intercity microwave relay stations has long been allowed by the FCC. For all of these reasons, Commission approval of the CBS Affiliates' limited, mixed ownership proposal for the pilot program would not constitute a precedent for the adoption of similar proposals for potential users of the satellite system other than television broadcast stations. The use of satellites and receive-only television relay stations for interconnecting television broadcast stations is unique.

Our proposal also has the advantage of enabling COMSAT and the FCC to allow for television broadcast station participation in the pilot program without having to deal with a great many individual television broadcast stations.

All the television broadcast stations that have an interest in the proposal have been, or will be, invited to participate in the CBS Affiliates' plan. We have also discussed the matter with the affiliate associations of both the NBC and ABC television networks. The preliminary discussions have encouraged us to believe that one or more representative locations could be chosen where a receive-only ground station could be constructed, owned and operated jointly by a group of stations in the two Western time zones to provide interconnection service to a number of stations serving the general area around the ground station. The location that would be chosen would most likely be one in which the stations do not now receive television network interconnection service through the facilities of terrestrial common carriers. Arrangements would also be made for the station or stations directly benefiting from the ground receiving facilities to reimburse the other contributing stations for their investment once the pilot demonstration program has been completed.

The CBS Affiliates' proposal has the further advantage of enabling all concerned to obtain knowledge and experience that will be helpful in deciding critical questions concerning ownership of various segments of the communications satellite system that will be ultimately authorized. More specifically, allowing the television broadcast stations to participate in the COMSAT pilot demonstration program in this manner would enable the stations to determine accurately what the costs of construction, operation and management of a receive-only ground station would be. It would also enable the stations to derive actual experience in operating under the COMSAT common carrier rate structure, the rate structures of terrestrial common carriers and the payment structures of the national television networks for stations receiving their nonlocal programming through satellite transmission.

It may be that, as a result of such participation in the pilot demonstration program, television broadcast stations will decide that it would be impractical for them to own receive-only television relay ground stations, but this is something that may most rationally be decided after stations have had actual experience in owning, operating and managing such facilities as part of a test program.

We understand fully COMSAT's concern that all of the receive-only television relay ground stations must be technically compatible with the satellite and ground facilities operated by COMSAT and other carriers. I assure you that we share this concern. We assume that COMSAT would actively participate with the television broadcast stations in establishing the specifications and in planning the construction of the receive-only television relay station or stations to be jointly owned by television broadcast stations. Indeed, if COMSAT and the FCC decide that specifications for all the television relay stations should be established by COMSAT, we would have no objections. Moreover, subject to Commission approval, COMSAT personnel could actively participate in the operation of the television broadcaster-owned ground stations while the satellite system is being constructed and tested. In addition, COMSAT should be permitted to test and evaluate the workings of the entire system.

We believe that the Commission does not have to decide the complex earth station ownership issue in order to approve COMSAT's pilot program with television broadcast stations having an ownership interest in at least one of the 30 receive-only television relay ground stations. It is doubtful that such relatively simple facilities fall within the meaning of the term "satellite terminal station," as it is used in the Communications Satellite Act of 1962. In any event, no ultimate ownership questions need be finally resolved in the context of Commission authorization of the COMSAT pilot demonstration project.

The CBS Television Affiliates Association strongly supports the COMSAT proposal for a pilot demonstration program with ownership participation by television broadcast stations as outlined above and will urge that the Commission authorize COMSAT to initiate its pilot program without delay.

Sincerely,

A. James Ebel

A. James Ebel
Chairman
Satellite Communications Committee
CBS Television Network Affiliates Association

cc: David Acheson - COMSAT

COMMUNICATIONS SATELLITE CORPORATION
1900 L STREET, N.W.
WASHINGTON, D. C. 20036
466 - 4544

DAVID C. ACHESON
VICE PRESIDENT & GENERAL COUNSEL

May 20, 1968

Mr. A. James Ebel
Chairman
Satellite Communications Committee
CBS Television Network Affiliates Assn.
40th and W Streets
Lincoln, Nebraska 68501

Dear Mr. Ebel:

We have given considerable study to your letter of April 16, and Mr. Goldberg's of May 10, 1968, regarding the CBS Network Affiliates' proposal for ownership of a receive-only station for distribution of television in the framework of a pilot demonstration program for domestic satellite communications. In our informal discussion with you and Mr. Goldberg we have indicated the questions that we see in the proposal, questions which are related, of course, to broader issues that have been raised by us and others by submissions to the FCC in the domestic satellite inquiry. We do not think that our questions are resolved in a fashion which would permit us to put a recommendation to our Board of Directors or to submit comments to you on the proposal for filing with the FCC. We appreciate, however, the points that are made in your letter and your assurances of support for the requirements of technical compatibility and system integrity.

Many thanks for giving us such a full explanation of your proposal.

Sincerely yours,

David C. Acheson

David C. Acheson

cc: Henry Goldberg, Esq.
Covington & Burling

1963 General Sarnoff of RCA and Mr. Geneen of IT&T both wrote to the Chairman, Senator Warren G. Magnuson of the Senate Commerce Committee, expressing their concerns over the current situation.

1964 The Chairman of the FCC and the Acting Special Assistant to the President for Telecommunications wrote the Secretaries of State, Defense, and the Attorney General proposing a broad study, "of present and anticipated problems affecting the nation's external telecommunications facilities, to the end that we may agree on action to be taken to resolve such problems." These officials established the Intra-Governmental Committee on International Telecommunications.

THE WHITE HOUSE
WASHINGTON

June 1, 1966

TO: Milton Semer

FROM: Jim O'Connell

I have followed your suggestion and produced one memo to the President from me and a draft memo containing some suggested statements which you might wish to make to the President.

In addition, I enclose:

1. Two copies of the Wiesner/Henry letter which established the Committee;

2. Two copies of expressions of concern over international telecommunications by Government officials and leaders in industry.

You may, if you choose, enclose these with the memo to the President. I enclosed in my memo to the President only the report and the expressions of Congressional interest. I am available for discussion.

J. D. O'Connell

Enclosures

MEMORANDUM

THE WHITE HOUSE

WASHINGTON

June 1, 1966

MEMORANDUM FOR THE PRESIDENT

This memorandum encloses the report of the Intra-Governmental Committee on International Telecommunications. The report represents the unanimous consensus of the departmental representatives concerned. The study which it summarizes was initiated as a result of repeated expressions of Congressional interest (see Enclosure 2) and concerns voiced over the years by leaders in both government and industry.

The study examined the structure of the U. S. international telecommunications industry; its past difficulties, performance, and economic experience; its future potential as a viable industry; its probable performance as an instrument for public and national service, and its capabilities as an instrument of national policy in the rapidly changing world of the present and future.

Summarized findings of the report are:

1. International telecommunications are vital to the social, commercial, diplomatic, and defense activities of the United States in its present world environment.

2. Our statutory framework should provide the basis for U.S. industry to adapt to the most advantageous use of new technology and the changing world situation. Authority for guidance of such adaptation and determination of the public interest should be vested in the FCC.

3. All necessary steps should be taken to ensure that the overseas telecommunications system of the United States is structured to facilitate most efficient and economical performance in meeting private and government requirements, and furthering domestic and international goals.

4. To enable restructuring to be undertaken by the carriers, the Congress should act now to remove the legislative bars to reorganization of the industry by enacting appropriate permissive merger legislation.

J. D. O'Connell

Enclosures

MEMORANDUM

THE WHITE HOUSE

WASHINGTON

DRAFT

MEMORANDUM FOR THE PRESIDENT

As part of my study of the attached report of the Intra-Governmental Committee on International Telecommunications, I have had several discussions with Mr. O'Connell. The Senate Subcommittee on Communications of the Commerce Committee has indicated that it will probably make this report available to the press as soon as it is received by the Committee. Reactions which can be expected are:

1. General approval by the Communications Satellite Corporation and the rest of the industry of the recommendation to remove legislative barriers which now prevent modernization of the industry structure.

2. Criticism by the strongest proponents of reorganization that the report does not go far enough toward creating a single chosen instrument to conduct U.S. overseas communications.

3. Criticism of restrictive guidelines which could be regarded as prescribing excessive regulation.

4. Criticism that some of these guidelines will make difficult the organization of a single merged company.

5. Opposition from the American Communications Association (labor union representing approximately 3,000 members) which wants no change in the present structure.

6. Approval of the Communications Workers of America (labor union representing over 400,000 members) whose President expressed the view that the present international structure was obsolete and poorly represented United States interests abroad.

7. Approval by the Senate Commerce Committee, with possible exceptions that the report is not sufficiently strong in its recommendations.

8. Approbation by the Senate Commerce Committee on receiving for the first time a unanimous position on this subject from the Executive Branch and the FCC.

Your Special Assistant for Telecommunications, Mr. O'Connell, feels strongly that merger, including the Communications Satellite Corporation, is necessary to achieve the national objectives in telecommunications as set forth in the Communications Satellite Act of 1962. Present conflicts between ComSat and the rest of the industry, and between other industry companies, are detrimental to the national interest, inhibit progress, jeopardize future industry viability, and cost us international confidence and respect.

He concludes also that there is now an opportunity for an act of statesmanship which will:

1. Enhance the prestige and respect of the United States in international circles;

2. Provide us with a strong communications institution to bring costs and prices down;

3. Stimulate much more communication between the U. S. and the rest of the world;

4. Organize us for world leadership in telecommunications, thus implementing our present technological leadership.

Milton P. Semer

____ Send to Congress with my approval

____ Send directly to Congress without Presidential endorsement

____ Disapprove

____ Request further discussion

THE WHITE HOUSE
Washington

January 24, 1964

MEMORANDUM TO SECRETARY OF STATE
SECRETARY OF DEFENSE
ATTORNEY GENERAL

FROM: Acting Special Assistant to the President for Telecommunications
Chairman, Federal Communications Commission

SUBJECT: Joint Study of International Communications

Preliminary Statement

1. In view of the interest of your Department in maintenance of a strong and efficient system of telecommunications between the United States and overseas points, and the attainment of the national objectives set forth in the Communications Act and the Communications Satellite Act, we invite you to join with us in a study of present and anticipated problems affecting the nation's external telecommunications facilities, to the end that we may agree on action to be taken to resolve such problems. Although problems affecting international communications are of concern to a number of Federal offices, their resolution is of paramount interest to your departments and agencies listed above and can be achieved most effectively through your cooperation.

Background

2. Efficient telecommunications between the United States and the rest of the world are, of course, a prerequisite to the effective conduct of foreign relations, to national defense, to the implementation of international commercial activities and our international economic policies; and are essential to social intercourse, the promulgation of our American ideals and the exchange of information.

3. United States international communication facilities are operated primarily by private companies under regulation by the Federal Communications Commission. These companies supply the public with

communication services, and also furnish essential services to the government. In addition, there are certain facilities operated by the government, principally the Department of Defense, to meet specialized diplomatic, military and other requirements.

4. The private industry sector may be divided into companies primarily engaged in furnishing telegraph (record) services and those principally furnishing telephone (voice) services. The three largest telegraph companies are the American Cable and Radio Corporation (wholly-owned by International Telephone and Telegraph Company) subsidiaries; RCA Communications, Inc. (wholly-owned by Radio Corporation of America), and Western Union International (an independent company which acquired the cable system recently divested by the Western Union Telegraph Company). The principal company offering voice services is the American Telephone and Telegraph Company. All these companies, except Western Union International, offer service by both cable and radio. The American Telephone and Telegraph Company operates through its own facilities, while the telegraph carriers operate both via their own facilities as well as through facilities leased in telephone cables. Satellite communications facilities are being developed for commercial use by the Communications Satellite Corporation, which will lease such facilities to the above companies and others. (DOD is also developing satellite communications facilities.) Developmental work in the United States on very high capacity transistorized telephone cables is being carried on by the American Telephone and Telegraph Company.

5. Facilities at overseas points are needed to complement facilities in the United States. To a large degree such foreign facilities are government operated, but in some instances are privately operated. Foreign communications administrations are also carrying on development work with cables and satellites, and are interested in such means, as well as other facilities, for communication. So far as the United States is concerned, the private companies have in the past exercised the initiative, subject to Federal regulation, in negotiating bilateral or multilateral agreements with foreign communications administrations and companies regarding such matters as installation of connecting facilities, types of services to be offered, and operating practices. Relationships between the Communications Satellite Corporation and foreign communications administrations will be subject to a greater degree of government regulation and supervision than now obtains with respect to conventional communications carriers. This is due to pertinent provisions of the Communications Satellite Act requiring such supervision.

6. Advances in the art have been rapid in the last decade. From the 1800's to the 1920's our external telecommunications facilities consisted only of telegraph cables; from the 1920's to the 1950's expansion was by way of high frequency radio; and from the 1950's to the present additional facilities have been provided through telephone cables. In the past few years, research and development have indicated the feasibility of satellite communications (relay of microwave frequencies via satellite) and transistorized telephone cables. Both of these developments, and particularly the former, can increase our present external telecommunications capacity many-fold at potentially lower unit costs.

7. With the great improvements in facilities and increases in capacity usable for overseas telecommunications to meet essential government and non-government needs, there has been at least as great an evolution in the nature of the telecommunications traffic handled. Conventional message telegraph service, and the familiar subscriber telephone service have been supplemented by a great variety of new services such as 100 words per minute automatic teletypewriter, leased line voice and record, high quality program transmission, facsimile, and digital data service, ranging from slow speed telemetering of instrument readings to high speed computer-to-computer transfer of data in a solid bit stream. New scientific and technical advances in recent years promise to provide capacity and circuits over which even more types of international voice, record, and data services, including television, may be provided.

Problems

8. The rapidly accelerating pace of developments in the field of external communications has raised a number of basic policy problems and the need to reevaluate the adequacy of existing policies. One complex of such basic problems relates to the orderly integration of satellite communications into the existing industry structure in a manner best designed to assure the viability of the Communications Satellite Corporation, as well as of the industry as a whole. This problem is aggravated by the emergence of high capacity transistorized telephone cables, a major advance in the art. This development could complicate the problems already facing the Communications Satellite Corporation and impinge upon the paramount national objective for the prompt establishment of a global communications satellite system.

9. A further complication results from the competing efforts of the American Telephone and Telegraph Company and the international telegraph carriers for the provision of new and expanding services, particularly those requiring broad-band facilities of a type available in telephone cables. The demand for leased channels of this type for use in transmitting voice-record-data intelligence on a simultaneous or alternate basis, and for use in transmitting high-speed data, is expected by many to grow significantly. This in turn requires reappraisal of the traditional concept that voice and record services should be furnished by separate and independent carriers in order to preserve a measure of competition in the communications field. At present the telegraph carriers are dependent primarily on AT&T for broad-band facilities, a dependency that can be mitigated by the availability of satellite facilities or by a restructuring of the ownership of existing or prospective submarine cables.

10. Aside from the foregoing problems which must be solved to meet normal business, social and governmental needs, the importance of a strong and healthy external telecommunications system, which will be capable of providing modern facilities to satisfy essential diplomatic, military and other national security requirements, is obvious. The lack of capability for instantaneous and reliable transmission of a variety of communications to meet these needs to various points in the world may seriously affect our security. In fact, with the changes in technology of weapons systems, particularly the advent of nuclear explosives which are now deployed on a world-wide basis, the availability of adequate communications facilities becomes critical to national survival. Recurring international crises have repeatedly demonstrated that the communications resources available to the U. S. Government have not met the needs of the national command authorities. The various crises of recent years have provided ample evidence of the inadequacies and variable reliability of the present array of communications systems and procedures upon which the President and his key policy officers rely to gain essential information concerning the world situation and to disseminate policy decisions and action commands.

11. From this lack came the decision to establish the National Communications System "to provide necessary communications for the Federal Government under all conditions ranging from a normal situation to national emergencies and international crisis, including nuclear attack."

The use of slow speed ocean telegraph cable, higher speed HF radio telegraphy and radiotelephony, transocean telephone cables and now communications satellites, should provide the necessary redundancy, capacity, and reliability to meet the minimum needs of communications for national security. The realization of this goal, without unnecessary duplication and at a feasible total cost to the nation, depends on the flexibility and coordination of all military and civilian communications facilities.

Discussion

12. All of the foregoing have caused concern, not only within the government, but also within the industry. The Federal Communications Commission as well as certain other agencies of government, have substantial statutory grants of power pursuant to which they may regulate, guide and control development in this field. However, under existing law these powers can be applied only within the established structure of our communications system. To the extent that any problems arise from or are inherent in the basic structure, the ability of any of the agencies of government or of the industry itself to suggest or apply appropriate solutions is limited. For this reason, it has been urged from time to time[1/] that additional legislation should be enacted or existing laws should be revised so that necessary changes can be effected in the structure of the external communications industry to enable the United States to realize maximum benefits from modern day communication advances and enable it to develop the most efficient and economical international communication services and facilities.

1/ For example, the Chairman of the International Telephone and Telegraph Company has proposed strict separation between voice and record communication and the enactment of legislation permitting or requiring the merger of the international telegraph companies. On the other hand, the Chairman of the Radio Corporation of America has proposed an even more far-reaching move, namely, the absorption of all United States commercial external telecommunications facilities into the Communications Satellite Corporation. Finally, the Chairman of the American Telephone and Telegraph Company takes no position as to whether or not there should be a merger of the telegraph companies, but does assert that the Communications Satellite Corporation should retain its status as a carrier's carrier and should not be used as an instrumentality to absorb other international telecommunications operations.

13. The present situation presents both a serious challenge and a unique opportunity by virtue of the development and application of vastly new and improved communications capabilities having both domestic and world-wide implications. On the one hand, the industry could be permitted to attempt to cope with these new developments as best it can within the established structure and subject to existing regulatory controls and policies. On the other hand, a study in depth might be undertaken to identify and analyze existing and foreseeable problems, to explore possible alternative solutions, and to arrive at a consensus regarding the course to be followed to assure the achievement of national goals in the field of telecommunications. These goals envision the provision of the best possible service at reasonable charges; the expeditious fulfillment of national policies and objectives in the field of telecommunications; and the provision of maximum capacity, flexibility, reliability and security in communications to meet the needs of national security. In the course of such study specific attention would be given to the aforementioned recommendations made by the responsible heads of certain of the international communications entities that the structure of international communications facilities be changed. In connection with these recommendations it would be necessary to weigh all the claimed advantages of an overall merger, or a more limited telegraph merger, against: (a) the practical advantages which have thus far been found to accrue from competition in this field; (b) the social benefits inherent in either full scale or limited competition; and (c) the danger inherent in establishing a monopoly in this very sensitive field with the permission or at the behest of the Government. Finally, in considering whether such a study should be undertaken it is relevant to note that the Chairmen of both the Senate and House Committees which have jurisdiction over and responsibility for this field have expressed great interest in such an overall study and in receiving appropriate unified recommendations from the regulatory and executive agencies.

Recommendation

14. In view of the foregoing, it is felt that a general study of the type described above should be undertaken to assure that our external telecommunications operations may be conducted on the soundest possible basis. Your departments have broad responsibilities in this field and are in a position to contribute needed resources and information to such a study.

It is therefore requested that you join with the Office of the Acting Special Assistant to the President for Telecommunications and the Federal Communications Commission in planning, organizing and conducting this study. In conclusion, we feel we must emphasize that in order to assure that the study will be both fruitful and effective, it is essential that every attempt be made to agree upon a report and course of action that would result in the presentation of unified policy recommendations to the Executive and the Congress. We solicit your cooperation and support to this end also.

Jerome B. Wiesner
Acting Special Assistant to the President
for Telecommunications

E. William Henry
Chairman
Federal Communications Commission

31 May 1966

Summary of Congressional Interest in International Common Carrier Telecommunications

1910 Congress legally recognized the public utility character of telegraph and telephone communications by an act bringing them within the provisions of the ICC Act for regulatory purposes.

1927 The Radio Act of 1927 created the Federal Radio Commission declaring Congress' intent to regulate interstate and foreign radio communications.

1934 Communications Act of 1934 created the FCC and provided for the regulation of interstate and foreign commerce in communication by wire and radio.

1943 Senate Resolution 187 (78th Congress) directed study of international communications.

1945 Extensive hearings before a Subcommittee of the Senate Commerce Committee on the so-called "Forrestal proposal" for consolidation of all U.S. international telecommunications operations within a single new carrier to strengthen international communications and better serve the needs of national security.

1959 Hearings before the Committee on Interstate and Foreign Commerce, United States Senate, on a proposal to amend the Communications Act of 1934 to permit consolidations or mergers of international telegraph and marine carriers.

1961 Senator Pastore wrote President Kennedy, saying "At the present, there is no single agency that now regulates Federal and non-Federal use of telecommunications facilities. There is no clear-cut long range policy nor a mechanism that will lead to the formulation of such policy." The letter also said, "In addition, the review should include the policies with respect to international radio and wire communications and the relationship of government communications and non-government communications in that field." The letter further said, "I know there are various approaches in developing a program to evaluate the country's policy. One is the approach set forth in S.J. Res. 32 introduced by Senator Vance Hartke and others. Another would be the issuance of an Executive Order comparable to the one issued by President Harry Truman in 1950. Time is of the essence. Action must be taken immediately."

1961 Hearings before the Communications Subcommittee of the Committee on Commerce, United States Senate, on Space Communications and S.J. Res. 32, in his opening statement in this hearing, Senator Pastore said, "In concluding, I want to state that even after agreement is reached within the United States on the space program, the problem will then move to another sphere --that involving the international arena. We all

know a space communications system operates across and above the boundaries of all countries, therefore, must require a full understanding and agreement with all the countries with regard to the use of the frequencies if we are to have an orderly development.

"In 1963 an administrative radio conference is to take place in Geneva, Switzerland, at which time negotiations regarding the allocation of frequencies among foreign countries particularly as it applies to space communications is to take place. Needless to say that the country that is successful in placing an operable communications satellite into the air will be in a strong position to exercise leadership leading to the acceptance of technical requirements and to the arrangement during the 1963 conference.

"The Chairman of the Commission, as well as Commissioner Craven, who has worked hard in this field, knows of my interest in this subject. It is obvious, I am sure, to everyone that a sound, overall telecommunications policy is essential if an orderly development of a space communications system is to take place. I am hopeful that the Commission, as well as the other agencies who are to appear before this committee, will indicate how best the United States can achieve this objective."

1962 Communications Satellite Act of 1962 established the policy for U.S. exploitation of space technology for the improvement of world communications.

1962 Report of the activity of the Committee on Commerce (Senate) 87th Congress, reported the hearings on space communications and urged action with respect to the Western Union divestment requirement.

1962 In the hearing on confirmation of Dr. Irvin Stewart as Director of Telecommunications Management, Senator Pastore posed these questions among others:

> "3. How shall the U.S. develop a national policy and position for dealing with other nations in seeking international telecommunications agreements?"
>
> "4. How shall the U.S. develop policies and plans to foster the soundness and vigor of its telecommunications industry in the face of new technical developments, changing needs, and economic developments?"

1962 In the confirmation hearing on E. William Henry to be a member of the FCC, the Committee expressed interest saying, "This Committee is going to request the views of Dr. Stewart as well as the FCC as to its policy and recommendations in the early part of next session concerning the telecommunications development in the international field and we are hopeful when you assume your responsibility that you will work closely with Dr. Stewart and

be prepared to submit some recommendations with regard to the telecommunications policy."

1963 Senator Magnuson in an extension of remarks in the Congressional Record said, "Mr. President, of great concern to the Committee on Commerce, among the numerous subjects that we have had to consider in that committee recently, has been the problem of the development of a unified international overall communications policy."

He also said, "Recently David Sarnoff, chairman of the board of Radio Corp. of America, and Harold S. Geneen, president of the International Telephone & Telegraph Corp., wrote to me concerning the need for the development of a unified overall communications policy. This question of the establishment of an overall telecommunications policy has been raised by the Senate Commerce Committee during hearings on a number of occasions. Such a policy is essential if we are to meet the current and future needs resulting from the technological development of the space age."

He also said, "The Senate Commerce Committee is keenly interested in this subject. It is my hope that the interested agencies will complete their various studies in this field so that the Senate Commerce Committee can have the benefit of their

views. In the meantime, I ask unanimous consent to have printed in full the text of the letters that I received from Mr. Sarnoff and Mr. Geneen so their views can be available to my colleagues.

"I also ask unanimous consent to have printed in the Appendix of the Record an address delivered by Hon. E. William Henry, Chairman of the Federal Communications Commission, before the Standing Committee on Communications of the American Bar Association at its 86th annual meeting, held in Chicago in August, relating to the same subject."

1964 In the Report of Investigations by the Senate Committee on Commerce, the Committee referred to the blurring of the distinction between voice and record communications from a technical operating standpoint, and the use of voice/record communications. It referred to the Communications Satellite Act of 1962 which has "brought with it a host of problems that require careful study." It also referred to the letters of David Sarnoff of RCA and Harold S. Geneen of IT&T concerning the need for over-all telecommunications policy.

1964 In the hearings on the nomination of James D. O'Connell as Director of Telecommunications Management, Senator Pastore

said, "The telecommunications system of the United States is an integral part of the whole structure of the country and pervades every aspect of our lives. Fast-moving technical developments and expanding needs in the communications field require a review of our present policies as well as a complete evaluation of the allocation of frequencies so as to assure the most effective use of this scarce but valuable resource.

"At one time telegraph and telephone operations were wholly separate, and competitive conditions in the record and voice transmissions could be viewed independently. Now, however, the distinction between voice and record communications from a technical operating standpoint has become somewhat blurred.

"The same circuitry used for voice can be used for digital computer information. New broad-band services now offer a customer communication channels which he can use for voice or record communications as he chooses.

"A communication satellite can transmit a picture used for television or a signal that is used for telephone conversation. Technological developments are still continuing at a rapid pace. The space communications program, as set forth in the Communications Satellite Act of 1962, has brought with it a host of problems that require careful study.

"Last summer David Sarnoff, chairman of the board of Radio Corporation of America, and Harold S. Geneen, president of the International Telephone & Telegraph Corp., wrote to this committee concerning the need for the development of an overall communications policy. Such policy is essential if we are to meet the current and future needs flowing from the technological developments of the space age."

1965 In the Report of Investigations by the Committee on Commerce (Senate), the Committee repeated its admonition of the need for national policy and position for dealing with other nations in seeking international telecommunications agreements. It also referred to the charge in the Communications Satellite Act of 1962 that there was to be established as expeditiously as practicable a commercial communications satellite system, as part of an improved global communications network, and indicated that the Committee is following all of these developments very closely.

1966 In its Report of Investigations by the Committee on Commerce (Senate), the Committee noted the formation of the Intra-Governmental Committee on International Telecommunications under the joint chairmanship of E. William Henry, Chairman of the FCC and James D. O'Connell, Director of Telecommunications

Management. The report further states, "the Intra-Governmental Committee indicates that it will have its own report and recommendations complete in the spring of 1966 and submit it to the Senate Commerce Committee. This will result in a formulation of guidelines in the international telecommunications field and will require extensive hearings."

May 31, 1966

Actions and Expressions of Concern over International Telecommunications by Government Officials and Leaders of Industry

1919 President Wilson initiated and Owen Young of General Electric, and other industry officials successfully carried thru the plans to establish the Radio Corporation of America to retain important equipment, patents and operations of U.S. international telecommunications under the control of an American corporation.

1945 Secretary of the Navy Forrestal largely initiated and strongly supported in a Senate hearing the concept of establishing a single chosen instrument international telecommunications carrier to operate all overseas services and provide communications support to the public, industry and government. The divided structure and individually limited capabilities of the United States overseas carriers had necessitated the Army and Navy building a massive global communications system to meet the needs of World War II.

1949 Senator McFarland of the Committee on Interstate and Foreign Commerce initiated a study of the international telegraphic industry by All America Cables and Radio, Inc., The Commercial Cable Company, and Mackay Radio and Telegraph Company, all of the IT&T group, and RCA Communications, Inc., and Western Union Cables.

1950 A study of American international record communications industry was completed by Paul Mazor in response to the McFarland request of 1949.

1950 President Truman in creating the President's Communications Policy Board said: "Communications services represent a vital resource in our modern society. They make possible the smooth functioning of our complex economy. They can assist in promoting international understanding and good will; they constitute an important requirement for our national security." In response to this point the Board in its report of March 1951 stated, among other things: "Telecommunications present a special combination of technical, economic, social, and political problems. The telecommunications system as a whole, public and private, depends to an unusual degree upon a technology which is changing and growing with marked rapidity. The task of adjusting organization and practice to take advantage of technological advances is complicated, however, by the connection of telecommunications with both the national security and the international relations of the United States."

1953 Under the auspices of Counsel for the Senate Interstate and

Foreign Commerce Committee and representatives of International Telephone and Telegraph Corporation, Radio Corporation of America, and Western Union Telegraph Company formed a committee for developing merger data. This committee commissioned Lehman Brothers to conduct a financial study of the "merged company."

1959 Chairman John C. Doerfer, and Commissioners Craven, Cross, and Hyde of the FCC participated in hearings and supported the proposal to amend the Communications Act of 1934, as amended, to permit consolidations or mergers of international telegraph and marine carriers.

1962 Numerous Government officials supported the enactment of the Communications Satellite Act of 1962, providing for the formation of the Communications Satellite Corporation to represent the United States interest and participation in the world exploitation of communications via satellite.

1962 General Sarnoff, Chairman of the Board of RCA, raised major questions with respect to the current situation regarding overseas telecommunications, which he summed up in the following question: "Will the application of the present laws,

as they relate to communications, assure for this country the full benefits of science and technology, or will progress delayed result in progress denied?"

1963 Mr. Newton Minow in his letter to President Kennedy of May 31st, upon resigning the chairmanship of the FCC, raised the problem of the international telecommunications carrier industry as one requiring early attention, saying: "We can no longer afford the luxury of ... leisurely policy making."

1963 Chairman E. William Henry, of the FCC, in an address before the Standing Committee on Communications of the American Bar Association reviewed the salient problems of international telecommunications and said: "The concept of a merger of international record carriers, for instance, is not new." He concluded that it has much to recommend it, saying, "Above all, we need to keep in mind that in this field neither competition nor monopoly is to be sought for its own sake or for the sake of any individual company or group of companies. The goal, rather, is a method which will provide the best service to our country and to the world." He then recommended a plan of action and policy planning to deal with these problems.

ELECTRONIC INDUSTRIES ASSOCIATION

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

659-2200

November 14, 1969

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

Dear Mr. Whitehead:

Enclosed is a copy of a filing on FCC Docket 18397, Part V prepared by the Industrial Electronics Division of this association. In view of the important telecommunications-related work in which you are currently engaged, it seems appropriate to send you a copy of this filing in order that you might have available some of the forward thinking which represents a consensus of experts from this industry.

We will welcome any comments you might have, and will attempt to answer any questions that may develop. Thank you for your interest.

Sincerely,

John Sodolski
Staff Vice President
Industrial Electronics Division

JS/gr

Enclosure

December 2, 1969

To: Mr. John Sodolski
Electronic Industries Association

From: Eva Daughtrey
Secretary to Clay T. Whitehead

Mr. Whitehead has asked me to thank you for sending a copy of the filing on FCC Docket 18397. It was indeed thoughtful of you to send it.

EDaughtrey

Domsat (contd interests)

Wednesday 11/19/69

9:45 TW asked me to get a copy of the Domsat letter from AT&T over to Don Baker -- as requested from AT&T.

However, Don Baker had received the whole package of letters previously -- so I called to advise the secretary of Mr. Whitehead's request. She will tell Mr. Baker and call us if they need a copy.

Tuesday 11/18/69

11:45	Walter Routson is coming over at 11:30 on Friday (11/21) and will bring their new president, Paul Bartley. Mr. Bartley is formerly with Litton and Arvin.	293-4292

WESTERN UNION INTERNATIONAL, INC.
ALL AROUND THE WORLD
26 BROADWAY • NEW YORK, N. Y. 10004

E. A. GALLAGHER
President

November 17, 1969

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

Dear Dr. Whitehead:

I have followed with interest the recent published accounts of Comsat's latest proposal for a domestic satellite system.

Western Union International, Inc. (WUI) has expressed, in numerous letters to the White House and Federal Communications Commission, its desire to work with Comsat, as the carrier's carrier, in providing the most economical and efficient system. WUI has been active in overseas television transmission since the inception of the commercial satellite system, and provides all of its authorized services via the global satellite system, as well as by submarine cable.

The reports of Comsat's current proposal indicate the possibility of including Hawaii and Puerto Rico in the system. WUI currently serves both these points via satellite, as well as cable, and welcomes the prospect of participating in any further necessary improvement of service to Hawaii and Puerto Rico. WUI also proposes to serve Alaska, and it is presumed that methods of extending the new system to that State as well are being studied in a possible coordinated multi-purpose use.

WUI looks forward to providing service via any new satellite system. We are anxious to learn more about Comsat's proposals and, by copy of this letter, are requesting a meeting with Comsat for this purpose.

Very truly yours,

E. A. Gallagher

cc: Mr. James McCormack, Chairman
Communications Satellite Corporation

Honorable Dean Burch, Chairman
Federal Communications Commission

Domsat - outside

THE ASSOCIATED PRESS
50 ROCKEFELLER PLAZA
NEW YORK, N. Y. 10020

November 7, 1969

General George P. Sampson
Vice President - Operations
Communications Satellite Corporation
950 L'Enfant Plaza South, S. W.
Washington, D. C. 20024

Dear General Sampson:

On behalf of The Associated Press, I wish to express our appreciation for the Comsat briefing on the proposed domestic satellite system which was given newspaper industry and press association representatives at your headquarters November 5.

Especially noteworthy, we feel, are the principles of the "Non-Exclusive Cooperative" which Comsat favors for the domestic system.

As envisioned by Comsat, this domestic system would be non-exclusive in that the user category would be open ended and new users could be added at any time. This domestic system would be cooperative in that tariff charges would carry the cost of the system, additional revenues could reduce the users' costs, and flexibility would prevail as regards ownership of receive-only stations.

These principles for the domestic satellite system of the future would be significant and constructive benefit to the dissemination of news in our nation.

The Associated Press desires to use this future domestic satellite system, as planned by Comsat. We will want to cooperate closely with your staff, so that Comsat will know our communications requirements and we can implement our planning without uncertainty.

The Associated Press is the largest press customer of AT&T. Together with United Press International, we sought unsuccessfully to have the AT&T Telpak tariff liberalized to permit the two major press associations to share a Telpak lease.

DANIEL DE LUCE
ASSISTANT GENERAL MANAGER

Until Telpak A was cancelled in 1967, our Telpak A lease extended 10,000 miles across the United States and was billed at approximately $2,000,000 yearly by AT&T.

At present, we lease Telpak C in the northeast states. This is, of course, equivalent to 60 voice channels or 240-khz bandwidth. Under the reasonable economics which the domestic satellite system could create, The Associated Press would have a requirement for 240-khz bandwidth New York-Los Angeles.

This 240-khz bandwidth requirement refers to The Associated Press alone. We stand ready to cooperate with AP newspaper and broadcast members and with United Press International in combining industry bandwidth requirements and terminal facilities for maximum service and economy. Thus 240-khz could be just a starter for our combined planning.

Again, our warmest appreciation for Comsat's hopeful progress toward a domestic satellite system that could be so useful to all news media.

With best regards,

Sincerely,

DD:jw

cc: Dr. Clay T. Whitehead

DANIEL DE LUCE
ASSISTANT GENERAL MANAGER

Donovat — For outside interests — WHKelly 11/3 ED

TIME
INCORPORATED

TIME & LIFE BUILDING
ROCKEFELLER CENTER
NEW YORK 10020
(212) JU6-1212

CHAIRMAN OF THE BOARD

October 30, 1969

Mr. Clay T. Whitehead
Staff Assistant
The White House
Washington, D.C. 20500

Dear Mr. Whitehead:

Time Incorporated is pleased at the renewed interest in establishing a domestic communications satellite system. Such a system -- if its service is equitably priced and open to all users on a common-carrier basis -- will speed and improve the flow of information throughout the United States. We thought it appropriate at this time to make our interest in this matter known to you.

We at Time Incorporated will welcome the availability of a domestic satellite system. Continuing reviews of our requirements indicate that many of our communications needs could be fulfilled more efficiently and economically by satellites than by presently available means of transmitting information. Time Incorporated is desirous of being a customer of the domestic satellite system. We could use such a system in many aspects of magazine production and in a variety of other ways; e.g., transmission of the written and pictorial content of our magazines to production and printing plants around the country; maintaining our extensive subscription services; transmission of information required by our Selling Areas Marketing Information division; servicing our growing cable television operations. The foregoing are by no means all-inclusive. We are continually finding new ways

to use satellites to increase efficiency and lower costs in transmitting the information which is the basis of our business.

The domestic satellite system is particularly important to Time Incorporated because it will make possible a rational and equitable system of charges for service. Since distance is not a factor in computing the cost of transmitting information via satellite, this system will permit a rate structure independent of distance. Consequently, the new satellite system will enable us to transmit large amounts of information over long distances more cheaply than is possible through existing land-line systems.

But if this and other desirable results are to be achieved, and if the domestic satellite system is to be equitable and non-discriminatory, it must do the following:

1. From the outset, the satellite system must be a common-carrier. We believe that whoever owns the satellite should make it available at established rates to all who wish to use it. Access to the satellite cannot be limited to any particular group or class of users. The common-carrier principle has characterized the history of American communications, and should be a basic tenet of the new satellite system.

2. The rate structure must be based on the unique technological characteristics of satellites. As noted before, the cost of transmitting information via satellite is not a function of the distance involved. Hence distances should not be a factor in computing rates. Charges for the satellite should be based on the amount of time it is actually in use. The minimum charge should

be as low as economically feasible in order not to discriminate against customers with smaller volumes of material to transmit. A reasonable rate structure would include the costs of building, launching and maintaining the satellite and essential ground equipment, plus a reasonable profit for the satellite owner.

3. A common-carrier operator of the satellite system must be authorized to sell time on the system directly to customers who are bulk users. Such bulk users should not have to purchase time on the satellite through an intermediary communications company or common-carrier. Of course, existing, ground-based carriers would be free to purchase time on the satellite for the benefit of their own customers. Such ground-based carriers will continue to be the main source of terrestrial linkage between the satellite and the ultimate destination of transmitted information.

4. Customers of the satellite system must have the option of establishing, owning and operating their own ground stations for transmission between earth and the satellite. Such flexibility is imperative if users are to receive maximum efficiency and economic benefit from the satellite system. Appropriate Federal regulatory agencies should formulate high enough standards to ensure that such stations are equipped and operated in harmony with the rest of the system.

Since Time Incorporated's interests are involved, we hope to participate in future discussions about the domestic satellite system, and to be consulted at appropriate times.

Sincerely,

Andrew Heiskell

cc: Mr. Ben S. Gilmer
Mr. Leonard Goldenson
Mr. Julian Goodman
Mr. Rosel H. Hyde
Mr. James McCormack
Mr. Frank Stanton

Dennet
Notable

United Press International

GENERAL OFFICES
NEWS BUILDING, 220 EAST 42ND STREET
NEW YORK, N.Y. 10017

MIMS THOMASON
PRESIDENT

November 10, 1969

Mr. James McCormack
Chairman and Chief Executive Officer
Communications Satellite Corporation
950 L'Enfant Plaza South, S.W.
Washington, D. C. 20024

Dear Mr. McCormack:

I know I am repeating myself, but I want to say again how interesting we found your presentation on a Domestic Satellite communications system and its possible use by press associations in the dissemination of news and information to Broadcasters and Newspapers in the United States.

United Press International is very much interested in such a system and stands ready to participate in any way we can in its development. As you know, United Press International and the Associated Press are the two largest press users of AT&T's facilities. UPI is ready to cooperate with Comsat, the AP and other wire services to broaden press communications in a satellite system.

Sincerely,

Mims Thomason

AMT:pm

CC: Chairman Dean Burch
Federal Communications Commission
1919 M Street
Washington, D. C. 20554

Dr. Clay T. Whitehead ✓
Special Assistant to the President
The White House
Washington, D. C.

Union Calendar No. 834

90th Congress, 2d Session - - - - - House Report No. 1978

THE ALLOCATION OF RADIO FREQUENCY AND ITS EFFECT ON SMALL BUSINESS

A REPORT

OF

SUBCOMMITTEE NO. 5

TO THE

SELECT COMMITTEE ON SMALL BUSINESS

HOUSE OF REPRESENTATIVES

NINETIETH CONGRESS

SECOND SESSION

PURSUANT TO

H. Res. 53

A RESOLUTION CREATING A SELECT COMMITTEE TO CONDUCT STUDIES AND INVESTIGATIONS OF THE PROBLEMS OF SMALL BUSINESS

DECEMBER 23, 1968.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

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U.S. GOVERNMENT PRINTING OFFICE

98-008 WASHINGTON : 1968

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LETTER OF TRANSMITTAL

SELECT COMMITTEE ON SMALL BUSINESS,
HOUSE OF REPRESENTATIVES,
Washington, D.C., December 23, 1968.

Hon. W. PAT JENNINGS,
Clerk, House of Representatives,
Washington, D.C.

DEAR MR. JENNINGS: Transmitted herewith is a report of Subcommittee No. 5 of the Select Committee on Small Business entitled "The Allocation of Radio Frequency and Its Effect on Small Business."

This report is submitted with the approval of the full committee.

With kind regards, I am,

Very sincerely yours,

JOE L. EVINS, *Member of Congress,*
Chairman.

LETTER OF TRANSMITTAL

SELECT COMMITTEE ON SMALL BUSINESS,
HOUSE OF REPRESENTATIVES,
Washington, D.C., December 17, 1968.

Hon. JOE L. EVINS,
Chairman, Select Committee on Small Business, House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: Transmitted herewith is a report of Subcommittee No. 5 entitled, "The Allocation of Radio Frequency and Its Effect on Small Business."

The report, transmitted to you as chairman of the Select Committee on Small Business, has the approval of the subcommittee.

Sincerely yours,

JOHN D. DINGELL,
Chairman, Subcommittee No. 5.

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Union Calendar No. 834

90TH CONGRESS, 2d Session } HOUSE OF REPRESENTATIVES { REPORT No. 1978

THE ALLOCATION OF RADIO FREQUENCY AND ITS EFFECT ON SMALL BUSINESS

DECEMBER 23, 1968.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. EVINS, from the Select Committee on Small Business, submitted the following

REPORT

[Pursuant to H. Res. 53]

Union Calendar No. 834

92D CONGRESS	HOUSE OF REPRESENTATIVES	REPORT
2d Session		No. 1078

THE ALLOCATION OF RADIO FREQUENCY AND ITS EFFECT ON SMALL BUSINESS

FEBRUARY 22, 1972.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. EVINS, from the Select Committee on Small Business, submitted the following

REPORT

[Pursuant to H. Res. 521]

H. Rept. 1078, 92-2——1

THE ALLOCATION OF RADIO FREQUENCY AND ITS EFFECT ON SMALL BUSINESS

INTRODUCTION

At the opening of the 90th Congress, the Honorable Joe L. Evins (Democrat, Tennessee), chairman of the Select Committee on Small Business, assigned jurisdiction over activities of regulatory agencies to Subcommittee No. 5, and the following were designated as members:

Representative John D. Dingell, Democrat, of Michigan, chairman;

Representative Neal Smith, Democrat, of Iowa;

Representative James C. Corman, Democrat, of California;

Representative Silvio O. Conte, Republican, of Massachusetts;

Representative James T. Broyhill, Republican, of North Carolina.

Additionally, Chairman Evins and Representative Arch A. Moore, Jr., as chairman and ranking minority member of the committee are ex officio members of the subcommittee.

PURPOSE AND SCOPE

The purpose and scope of the hearings were set forth by Subcommittee Chairman Dingell at the opening session.

> The frequency spectrum is one of the most valuable economic resources possessed by our Nation. Like other natural resources, it is limited in quantity and is subject to competing claims of various economic interests. At the present time, the Federal Communications Commission acts as arbiter through its allocation process. The apportionment for that part of the spectrum which we wish to consider here today was made by the FCC in 1949. At that time, the 25–890 Mc/s band was allocated in the following manner:
>
> Approximately 60 percent for television and FM broadcasting; 34 percent to the Federal Government and Government-shared usage; something less than 1 percent for point-to-point radio use; and slightly less than 5 percent for land mobile radio services.
>
> During the almost 20 years since these allocations were made, our population has grown rapidly, our economy has achieved unprecedented growth, technology has proliferated almost beyond belief and the communications needs, reflective of all of these advances, have grown at an even more rapid pace.
>
> Yet, difficult as it might be to believe, no basic changes have been made in allocation of the radio frequency spectrum. New problems have been dealt with on an ad hoc

basis. While this has, upon occasion, effected temporarily relief of this or that need, it does not get to the root of the problem. As a distinguished member of the Communications Commission, Commissioner Nicholas Johnson, stated in his concurring opinion on docket No. 13847:

"What is needed are the basic data, techniques, and procedures which would allow us (the Commission) to make truly rational allocation decisions, and thereby maximize the contribution the radio spectrum makes to our nation."

Commissioner Johnson then went on to note that because of the ad hoc nature of the relief granted to land mobile users by the proceedings from which this quote was taken, the opportunity presented by docket No. 13847 to achieve these goals has now been forever lost. And, I would say parenthetically, that it is not the intention of this committee that such should happen.

Radio frequency congestion, although only one of the problems facing small businessmen today, is a great roadblock to business radio users who want to continue to serve the public with the services the public wants and the public needs.

We know, for example, that congestion is actually hindering the radio operations of businessmen in many areas of the country. Until the necessary action is taken by the FCC to allocate additional frequency spectrum to small businesses, the land mobile radio users, as the committee has recommended, this problem will continue to be one of primary interest to those of us who are interested in the problems of the small businessman.

THE ALLOCATION OF RADIO FREQUENCY AND ITS EFFECT ON SMALL BUSINESS

The Testimony

On February 20–21, 1968, the Subcommittee on Activities of Regulatory Agencies Relating to Small Business of the Select Committee on Small Business opened its hearings on "The Allocation of Radio Frequency and Its Effect on Small Business." Hearings were held in Washington, Los Angeles, Detroit, and Chicago to hear the testimony of many two-way radio users concerning the urgent need for additional frequency spectrum for the land-mobile radio services.

Two highly qualified technical witnesses, Mr. Richard P. Gifford, chairman of the Joint Technical Advisory Committee of the Institute of Electrical and Electronics Engineers and the Electric Industries Association, and James D. O'Connell, special assistant to the president for telecommunications and the director of telecommunications management, Executive Office of the President, were the first witnesses at this series of hearings. Mr. Gifford described the nature of the electromagnetic spectrum and the difficult choices which must be made in providing for its utilization. He said that the frequency spectrum is:

> * * * a natural resource which man has just begun to tap in the 20th century. By the 21st century, it will be every bit as significant in man's existence on earth or even beyond, as the oceans, fertile lands, and mineral resources are today.

According to Mr. Gifford, this natural resource differs from others, however, in that it has a third dimension. Beyond time and space, which are common to other natural resources, the electromagnetic spectrum has the dimension or characteristic of frequency.

> Its third dimension—frequency—makes it possible to make extensive simultaneous use of the phenomenon in the same place at the same time. It is this third dimension that makes the phenomenon a resource—a natural resource of vast dimension to be used in the service of mankind in conveying energy over long or short distances without wires.

In discussing the technical differences between the various frequencies he pointed out that small obstructions, such as buildings and hills, can become a problem starting at about 200 MHz and that foliage begins to absorb signals at about 400 MHz. Above 1 GHz, he said it is necessary to have a "clean line of sight" for transmitting.

Mr. Gifford noted that the Federal Communications Commission has been given the duty to allocate this radio frequency spectrum "as public interest, convenience, and necessity requires."

> Here is where the administrative role becomes most challenging for in making allocations to provide for orderly growth, one has to accept that such structure may later prove to constrain orderly growth.

Mr. Gifford compared the process of allocation to "spectrum farming."

> To see this challenge more clearly, let us turn to the analogy of the radio spectrum to farmland—land to be farmed for maximum total yield. The farm planner has already done his work and the farmlands are all designated for various crops. That plan made 20 years ago was based on his prediction of needs for the ensuing decades and the relative tillability of various lands for certain crops.
>
> One parcel of land was set aside for crop A. There being a great demand at the time, considerable extra acres were included in the parcel for crop A.
>
> Another parcel of land as set aside for crop B; this crop was badly needed at the time for some very specific nourishment but apparently much less land would be needed than for crop A.
>
> Now, 20 years later, there are still empty acres yet to be planted with crop A while those being farmed for crop B are full. In addition, the demand for crop B continues to increase at a steady pace and the increase in demand for crop A is tapering off.
>
> Now, the farm planner has a problem.
>
> Should he replan for crop B by taking land from crop A?
>
> or
>
> Should he suggest that more fertilizer be used to increase the yield on crop B thereby permitting continued growth on lands for B? or
>
> Is there a chance that either crop A or crop B might be replaced by a synthetic substitute in the next 10 years? or
>
> If he replans land for crop B, should he take land now in partial use, resulting in financial losses, or should he transfer unused land, that is less tillable resulting in increased cost in growing crop B?

Gen. James D. O'Connell, Special Assistant to the President for Telecommunications and the Director of Telecommunications Management, Executive Office of the President, told the subcommittee that he has approved the establishment in his office of a "Subcommittee on Spectrum Planning" which "* * * has dealt with such problems as the critical need for additional frequency resources in the case of land mobile service." He said that the contribution to the gross national product through the use of the spectrum is estimated to be in excess of $20 billion annually. He also pointed out that the land mobile radio services had been allocated 4.4 percent of the frequency spectrum between 30 and 960 MHz, while 55.1 percent of that total available spectrum space, or 87 percent of the nongovernment space, was allocated to radio and TV broadcasting use. In urban areas such as Los Angeles, New York, and Chicago, he said that the land mobile

situation had reached the "visible saturation" stage and that the saturation has already become "critical."

Mr. Seymour N. Siegel, the director of radio communications for the city of New York, who coordinates all the radio communications facilities used by the city, stated the need for additional frequency spectrum for land mobile radio, in part, as follows:

> Now, the fact is, and this is obvious, that there is just not enough spectrum space under the present allocations plan to meet the acute and urgent needs of our police department, our fire department and other agencies of city government.
>
> * * * * *
>
> The foreseeable needs for all of these is a considerable increase in our present allocation. As a matter of fact, on a conservative basis over the next 5 years, it appears that it is likely to more than double.
>
> * * * * *
>
> Two years ago in pleading for additional frequency channels the New York Police Commission said: "Our entire program for improved law enforcement is dependent upon obtaining additional radio frequencies."

Among the many other examples of benefit derived from improved communications Mr. Siegel used was the following:

> Today, with the two-way radio system, the average time of shutting down a water main break has dropped from about 4½ hours to about 20 minutes.

And, as an example of the significant savings to the public by the use of land mobile radio, he said:

> For example before we had the two-way system, let us say in the Borough of Brooklyn, you would have at least two water companies because if you had a water main break in Flatbush and there was another one that took place at the same time in Coney Island, you could not get to the first group [working on the break] which was at Flatbush, and, therefore, you had to have something in reserve.
>
> By means of radio you can reach them in the field and you can divert them and as a result of this, water companies which now cost, I would guess, somewhere in the neighborhood of $750,000 a year, when the cities are hurting so much for money, this sort of economy is a bread-and-butter one.

Mr. Siegel also discussed suggestions "* * * that the upper channels from 70 to 83 be made available for land mobile service * * *" but he found such suggestions inadequate because—

> * * * the equipment is not now available to enable the public safety users to implement the need for this spectrum space * * *
>
> * * * * *

> * * * the need, sir, is now. Riots in the street, for example, will not await production of the necessary equipment for immediate use.

Suggesting at least a partial solution to the problem of frequency congestion among land-mobile users, Mr. Siegel said:

> I believe that the Commission is now studying the geographic sharing of UHF channels as a possible palliative to the needs of metropolitan areas, particularly New York City. This may require new operating assignments for a considerable number of broadcasting stations which are now operating or under construction. On the surface this might appear to hold forth some promise, at least so far as our immediate needs are concerned.

Mr. Kenneth Norton, a physicist with the Institute of Telecommunication Services, Department of Commerce said he agreed with the testimony of Mr. Siegel. He stated that he believes that the lower seven UHF TV channels should immediately be reallocated to the land-mobile services. His reasons were:

> (1) The land-mobile services clearly need at least this much additional spectrum to meet their requirements during the foreseeable future, that is, the next decade.
>
> (2) Shifting the * * * television stations now operating on UHF channels 14 to 20, inclusive, to other VHF or UHF channels represents the most economical method of providing the spectrum required for land-mobile use.
>
> * * * * *
>
> (3) The 74 television channels available after this reallocation will be far more than adequate to meet the growing needs of both the commercial and public television services during the foreseeable future * * *.
>
> (4) Many, if not most, of the economically feasible ways for improving the efficiency of use of the spectrum now allocated to the land-mobile services have already been exploited * * *.
>
> (5) On the other hand, there are many economically feasible ways for improving the use of that portion of the spectrum now allocated to TV broadcasting.

Mr. William L. Detwiler, a manufacturer of land mobile radio equipment in Denver, Colo., and a director of the National Association of Business and Educational Radio, said that most of the companies which have installed two-way radio did it because, by improving their service and giving better service to their customers, they will improve their competitive position. He also said that he must spend a lot of time explaining to his customers why they have channel crowding when—

> * * * some of them have had occasion to flip their television to the all-channel UHF position and tune across the total UHF band and find nothing but snow. They ask me why they cannot use one of these many unused channels.

Mr. Detwiler also believes that television receivers could be designed to cope with shorter taboo spacings:

> So the taboos are not an immutable fact just like the allocation table is not. Those of us that feel that these taboos are ultra, ultra conservative, feel that this results in television receivers being manufactured down to the lowest common denominator.

To this, Mr. Howard Head, a consulting engineer for the Association of Maximum Service Telecasters, agreed:

> I would like to say that Mr. Detwiler is entirely right * * *.

Mr. Lester W. Lindow, executive director of the Association of Maximum Service Telecasters, called for better frequency coordination by the users of land-mobile radio. However, Mr. Detwiler stated that better frequency coordination among land-mobile radio users was not the answer to the problem of congestion.

> You get a situation like in New York City where Lou North of the Federal Communications Commission found 521 licensees, 4,570 mobile units, operating in a 34-square-mile area on 11 channels in the 150-megacycle business band, coming up with 47 licensees per channel and 410 mobile units per channel.
>
> You do not have anything to coordinate. You are trying to coordinate chaos. You pick out which would be the least unsuitable of the frequencies.
>
> * * * * *
>
> Mr. North believes that with somewhere around 75 mobiles on a channel, that that channel approaches congestion to where the communications on the channel break down. Yet, he found in New York City on these channels there was an average of 410 mobile units per channel. So, clearly we have a breakdown.

Mr. Detwiler also pointed out that the unused UHF–TV spectrum in the Denver area was a resource and that it was being wasted when it was not being used.

Mr. William Weisz, chairman of the Frequency Utilization and Administrative Committee of the joint FCC-industry Land Mobile Advisory Committee, spoke of the last reallocation of the radio frequency spectrum made 20 years ago.

> Now, I think it is important to reflect that * * * in 1949, the FCC made its last major spectrum reallocation. At that time, land mobile radio was almost nonexistent.
>
> It was primarily used by police, some power companies and similar users for dispatching emergency vehicles. The major uses of the radio spectrum at that time were for broadcasting, aeronautical, amateur, ship-to-shore, and international transoceanic messages.
>
> However, since the time of this last major reallocation of the spectrum by the Commission, the use of land mobile radio has burgeoned beyond belief.

> In 1949 there were approximately 80,000 licensed transmitters in the land-mobile radio services, while, as of the latest FCC annual report, there were approximately 2,440,000 transmitters in those services.

The result of this burgeoning land-mobile radio use has been extreme frequency congestion, and as Mr. Weisz noted, the Report of the President's Commission on Crime in the District of Columbia states:

> A study of the communications system showed that some field units had only a 25 percent chance of establishing immediate communication with the communications center because of the volume of air traffic. The [Crime] Commission regards this as a serious matter * * *.

Mr. Weisz also said that a great deal of frequency coordination already exists.

> The user groups that do the coordinating have been recognized by the Commission as competent people from the technical standpoint to evaluate the user requirement, recommend a proper usage of the frequency. The Commission will return an application that has not gone through a frequency coordination and indeed, the coordinator when he gets the requirements of the application from his records looks at all of the other uses in that area from a local standpoint and if he feels that the requirement is wrong or impinges upon some other requirement, he sends it back to the user.

Mr. Weisz pointed out that the reasons for which the city of New York uses radio frequencies (e.g. maintenance, dispatching, paving and contracting) are the same reasons for which private businesses uses two-way radio.

> * * * In fact, outside of the public safety activities, many of the things that are done by the city of New York are actually provided by businesses throughout the rest of the country.

Referring to the channel split in the 450–470 band which was recently required of land mobile radio by the FCC, Mr. Weisz said:

> * * * One of the things that goes unnoticed except to the land mobile people, is that every successive channel splitting degrades the service that is performed by the land-mobile people and increases the interference, and we should not forget that as an expense.

Mr. Norton agreed:

> * * * I believe that they [the channel splits] will result in some deterioration of service, even going as far as they have. So, there is not much room left for further splitting in any case * * *.

Mr. Vincent L. Wasilewski, president of the National Association of Broadcasters, described the search which nearly all users of the spectrum were engaged in to utilize the limited spectrum space efficiently and effectively. He noted that "within the last few years

the matter has become more pressing because advancing technology has resulted in the development of new equipment and new techniques" and that "this has brought about an expansion in the uses of the spectrum." He said that another major factor is simply the Nation's growth, not merely in population but in number and complexity of business and Government organizations. Mr. Wasilewski urged a three-step procedure to solve the frequency congestion problem: (1) the present usage of the spectrum should be thoroughly and critically examined; (2) potential solutions which might be accomplished without disrupting present spectrum allocations should be investigated; and (3) if it is determined that it is necessary to reallocate spectrum space, some sort of priority of spectrum users (i.e. broadcasters, police, business, etc.) needs to be established, based on both private and public interest considerations. Mr. Wasilewski concluded by reviewing broadcasting's development since the FCC established the allocations plan in 1949 by which TV and radio broadcasting was allocated 55.1 percent of the spectrum between 30 and 960 MHz and land-mobile radio was allocated 4.4 percent of that spectrum. He commented that the "spectacular growth" of radio and television broadcasting was possible because the broadcasting industry had the time and spectrum space in which to develop. Other witnesses, as noted, contrasted the congestion on the land-mobile radio channels due to the lack of spectrum space which was hindering the growth of two-way radio users. Mr. Wasilewski said that the NAB was in the process of formulating research which would go into such matters as the societal benefits of television broadcasting.

Mr. Lindow, executive director of the Association of Maximum Service Telecasters, testified that in the top 10 markets (New York Los Angeles, Chicago, Philadelphia, Boston, Detroit, San Francisco, Cleveland, Pittsburgh, and Washington, D.C.) there were three UHF–TV stations under construction and six stations on the air in the lower seven UHF channels which would have to be assigned new frequency channels if these seven channels were reallocated to two-way radio users. Mr. Howard Head, consulting engineer for AMST, said the cost of shifting a station to another channel would be "in the order of $100,000 to $125,000 per station."

Mr. Lindow also testified that since it was founded in 1956, MST has actively sought to maintain, and encourage, the growth of an 82 channel VHF and UHF television system. He commented that the number of studies and reports about the spectrum have grown more rapidly than the various uses of the spectrum and "like the increasing uses of the spectrum, some are not essential". Mr. Lindow also stated that "MST submits that until there are meaningful limitations on free access to the land mobile frequencies" by small businessmen and other land-mobile radio users, "ineffective spectrum management techniques would be unproperly rewarded by any resolution of the so-called congestion problem which gives land mobile access to television broadcast frequencies". He said that the uses of the spectrum by small businessmen "must be contrasted with the essential services provided to the public by the almost 800 local, commercial and non-commercial VHF and UHF television stations now operating in the United States".

The impact of Mr. Lindow's remarks concerning the relative value to the public of the "essential services" provided to the public by television stations and the use of the spectrum by small business land mobile radio users was more fully explored, as follows:

> Mr. DINGELL. Perhaps maybe the Chair could help clarify this problem by taking a little different example that might well be related. Let us take the case of a large truck loaded with one of these rotary drums of concrete which has broken down, which is incapable of using its land-mobile radio either because none has been made available because of the clogged spectrum or which is for all intents and purposes not usable because the spectrum happens to be well occupied by other users at this particular time.
>
> Or let us take, for example, the householder in the midst of a freeze with five or six sick kids in the household busily waiting for the arrival of either a repairman or delivery of oil which would be radio dispatched which might not be able to arrive on the scene because of a clogged spectrum.
>
> Or perhaps let us take a not badly disrelated situation where the pipes might have broken in the house and the housewife might be up to her ankles in water with impending falling plaster and other damages because a plumber cannot get through because he has not got the opportunity to get sufficient access to the spectrum.
>
> Now, I wonder which is more important to our society in value, a number of instances of this kind, or perhaps, let us say, Yogi Bear or something like that.
>
> Mr. LINDOW. Mr. Chairman, let us dispose of Yogi Bear and the other occupants of the 5 p.m. slot. Of course, that is picking out one particular time and station and the stations operate as I say, about 18 hours a day.
>
> * * * * *
>
> Mr. DINGELL. * * * Well, let us go on. Would you say that it was outstanding programing to put Topper and Doby Gillis on for the third or fourth time?
>
> Mr. WASILEWSKI. I would have a 4-year-old or 6-year-old that has not seen it. What I am getting at is this is a competitive——
>
> Mr. DINGELL. A 4-year-old or 6-year-old would have a number of other options at this time. "Another World." "You Don't Say." "Count Down Carnival." "Super Heroes Cartoons."
>
> Mr. WASILEWSKI. They might get that 3 years from now.
>
> Mr. DINGELL. Even one entitled: "Dark Shadows." "English—Fact and Fancy."
>
> What I am saying here, and I am not trying to raid the television spectrum, I am just trying to have efficient use.

In reply to Mr. Lindow's point that there should be meaningful limitations on free access to the land-mobile frequencies by small businessmen and other land-mobile radio users, Mr. Weisz described how the FCC, in its original setting up of the eligibility rules and

amount of spectrum allocated to each of the various types of land-mobile radio users, did make determinations as to who should be eligible and, by the number of channels and the way in which it allowed them to be used, did set up a form of priority.

The testimony, comments, and material filed in connection with these hearings by distinguished engineers, representatives of technical societies, Government agencies, and representatives of the television and land-mobile radio industries provided a background for the subcommittee's further investigation of the allocation of radio frequency and its effect on small business.

In June of this year, the subcommittee began hearing testimony from individual land-mobile radio users who have the problem of frequency congestion on a day-to-day basis. These users included both small businessmen and representatives from police departments and other State and local government departments and businesses which protect or otherwise serve small businessmen and the public generally. The director of the Newark Police Department, Mr. Dominick Spina, testified concerning the congestion on the frequency available for the use of the Newark Police Department:

> I want everybody in this room to know that the situation in Newark is so desperate that I thought it was necessary for me to come here. * * *
>
> * * * * *
>
> Radio communication is the primary police device for grappling with the urban problems growing out of rising crime rates, increasing automobile use, high percentage of minority residents requiring assistance and the explosive by-products of the sociological revolution.
>
> The Federal Communications Commission has arbitrarily established a "rule of thumb" that a single frequency cannot handle the radio message traffic of more than 100 mobile radio units. We invite this subcommittee's attention to the fact that the Newark Police Department is currently dispatching to 380 mobile radios on a single frequency which approximates four times the normal channel loading.

Director Spina then specifically discussed how the congestion caused by a lack of adequate frequency channels affected his department's ability to deal with the 1967 riot in Newark.

> Last summer Newark experienced one of the worst riots in the modern history of our Nation. The confusion due to lack of air space, and a single channel police department, was unbelievable. * * *
>
> As a result I feel that injuries, disorder and the loss of lives were definitely increased.
>
> * * * * *
>
> For example, you would have one section, one main street, on which there was looting. There would be many dispatches going over the air. Another car on another commercial street would begin to see looters coming into that area, and he couldn't get on the air in sufficient time, and therefore you didn't have enough manpower there, and that section went,

too; and that is one of the things that happened in our city at the beginning of the riot during the first 2 days.

* * * * *

If there was sniper fire in one part of the city, which happened often, * * * the police couldn't get through to radio communications to ask for help. Many times our people were pinned down and people were shot as a result of this sniper fire.

* * * * *

For example, people had been shot, and trying to get out a message for an ambulance for the victim * * * was practically impossible. There were times when radio cars had to go to a telephone and call communications to try to get an ambulance down or a first aid squad down in that area.

Asked whether the recent channel splitting by the Commission "had really completely solved this type of problem," Director Spina commented, "not at all," and confirmed the need for the allocation of additional frequency spectrum to land-mobile users.

Mr. Thomas J. Hennessey, Jr., the former fire commissioner of Wayne Township, N.J., described instances in which the number of users on the fire department's frequency channel interfered with its effective operation. He stated that there have been times—

* * * where we had a fire that the chief officer on the scene thought might need more equipment as a preventive measure. We tried to get a message through requesting additional fire equipment, and they [Dutchess County Fire Department] would come on the air, and we would have to just wait because their system blanks ours right out. You just cannot get a message through.

Mr. Hennessey described an incident—

* * * when a fireman got hurt at the scene of the fire, and we wanted to get an ambulance. We tried to contact one. They [Dutchess County] were conducting their Monday night test, and it took the ambulance crew approximately 45 minutes before they realized that we really needed them.

Mr. Todd Rosenburg, who is with the Rettig Coal Co. in Newark, recalled the riots in Newark and commented:

My equipment, which carries fuel oil, can be very volatile, and in the case of a molotov cocktail or something thrown into our trucks it could cause or create a terrific hazard.

Through the use of radio we were able to keep our equipment out of the troubled areas. And I am glad to say that none of our pieces of equipment were touched or damaged because of this.

Mr. Rosenburg also stated that his company has been forced to change channels once already because frequency congestion made it impossible to communicate with his trucks, and that his new channel now "has become overcrowded * * * and we sometimes have to

wait 10 or 15 minutes before we can get through to our trucks." During this period the truck will have traveled 5–8 miles or more, before it can receive the message about the change in its destination or the new delivery to be made.

Mr. Martin J. Dugan is president of Warner Communications Co. which supplies a major portion of the municipalities in northern New Jersey with communications equipment. He stated that:

> Smaller communities are crowded into the few frequencies not under the control of the larger cities to a point whereby radio systems resemble old-fashioned telephone party lines. Yet, at the same time, large cities do not have enough frequencies.

Mr. Walter Jurgensen of the Samuel Braen Cos., which do both road construction work and snow plowing, and which employ two-way radio in their operations, testified that during the snowstorms in New Jersey his company puts out approximately 150 pieces of snow removal equipment to remove snow from the highways, roads and streets, and that their radio system "is extremely helpful in coordinating our efforts with those of local government agencies to clear wherever necessary in order to keep traffic moving."

Mr. Stephen Sliker, representing the Quadrell Bros. Trucking Co. told the subcommittee that, in addition to their regular business use of the radios, his truckdrivers use their mobile radio units to report accidents and to perform other public services. He also said that:

> * * * in a 6-year period it has increased our business approximately 100 percent because we are in contact with all of our equipment to see that it is on schedule up to the minute.
>
> * * * * *
>
> We pride ourselves on our safety record, and use of the land-mobile radio has contributed to our safety record very definitely.

But he also stated that—

> * * * the system is breaking down because of the lack of sufficient frequencies * * *.

Mr. Sliker commented that there were UHF channels available to which land-mobile radio users should have access.

Particularly helpful information concerning both the serious nature of the frequency congestion facing the small business land-mobile radio users in an urban area such as New Jersey and the problems involved in licensing users for particular frequency channels was presented to the subcommittee by Mr. Denis Coggin, managing director of the Special Industrial Radio Service Association, Inc. (SIRSA). In a series of comprehensive written questions and answers, Mr. Coggin described the manner of, and steps which must be taken in connection with, the assignment of users to frequency channels. This material clearly sets out the system by which the FCC established priorities in connection with the use of frequency spectrum by land-mobile radio users, and the very substantial efforts made by the land-

mobile industry to effectively and efficiently administer that portion of the spectrum in accordance with the rules established by the FCC.

Mr. Coggin also included in the material he presented a channel-by-channel analysis of the frequency congestion which hinders the operations of small business land-mobile radio users in the New Jersey area. Congestion is caused not only by users in that area but also by two-way radio users licensed within a 75-mile radius of that area. The tabulation of users licensed on each frequency channel shows that 500 to 600 transmitters licensed on each channel is not uncommon for channels which have been in use for a period of time and 150 to 300 transmitters on channels which resulted from splitting existing channels in recent years. He pointed out that these split channels are also quickly becoming congested, and are not as good as before they were split. Mr. Coggin also included material comparing the $100,000 to $125,000 cost of changing the equipment of each of the few UHF TV stations which would have to move to new channel assignments to provide relief from the frequency congestion facing land-mobile radio users with the $4.98 million cost of the 450–470 MHz channel splitting ordered by the FCC to land-mobile radio users.

At hearings held in Detroit, Mich., Mr. James L. Trainor, an assistant to Mayor Jerome P. Cavanaugh, described the need of the city for additional frequency channels to provide:

> A channel for coordination and communication between the police and fire department.
>
> An emergency channel for coordinating the city's social and nonpolice agencies which are involved in civil disturbances.
>
> A command channel over which State and/or Federal forces could coordinate their activities.

Inspector Elmer Soldan, the commissioner of communications for the Detroit Police Department, listed additional urgent uses for two-way radios which the police department could not implement until additional frequency spectrum is allocated to the land mobile radio services. He said:

> First, we need a radio system for the exclusive use of the detective division which still must go to the telephone to receive instructions. * * *
>
> Also, our women's division and youth bureau groups also have the same problem as the detective bureau and must get their messages, or lets say the majority of the messages, by telephone.

In addition, Mr. Soldan said that one-way "pager" systems could replace many existing two-way radio systems used on a nonemergency basis, and provide increased communications capability to other city officials who presently have no radio. Since the cost of the "pager" unit is only one-fifth the cost of the two-way radio presently in use, it would save the city and the taxpayer substantial funds. "This is what we could do," he said, "if the necessary frequencies were available * * *."

In discussing from where the needed, additional frequencies should come, Mr. Trainor said:

> We do not feel it is necessary or even desirable that frequency reallocation must be made at the expense of the small businessman. These allocations could just as well come from military frequencies or commercial broadcast frequencies.

Mr. Morris Roach, the acting chief of the Detroit Fire Department described the walkie-talkies which permit communication with men who are off the fire-truck fighting a fire, saying:

> * * * we also need a frequency that someone can answer the men who are out of the rigs inside of a building who want to call for extra help or for aid if somebody is injured and so forth.

Mr. Roach also told the subcommittee that during the 1967 riot in Detroit, about 40 neighboring communities sent fire equipment into the city of Detroit to help control the constantly spreading fires, but because there was no one frequency common to all of the area departments, the Detroit Fire Department could not communicate with these firetrucks once they were at the scene of a fire. Consequently, they could not be quickly directed to other areas where help was needed.

Capt. Jack L. Foster of the Michigan State Police described the need of his department for many of the modern techniques of law enforcement, such as a scrambling device to keep criminals from monitoring police broadcasts. However, he said, no frequency exists upon which to use such a device. He commented:

> The technology appears to be way above the availability of frequencies, so this problem of security of communication will probably continue until something can be done to permit the further experimentation and developing of a jamming device of some nature that could be used with the frequencies that are available.

Mr. Otto Rhoades, the president of the Association of Public Safety Communications Officers, said he believes that in order to adequately meet the communications needs attendant upon a large civil disturbance, a tornado, or similar crisis, you must have more than one area-wide channel reserved for emergency use but "these channels are not available."

Chief William Schaeffer, chief of police of Southgate, Mich., discussed the needs of a 15-city mutual aid task force which has banded together the police and fire resources in the communities south of Detroit in order that they may together more effectively cope with any situation within that area. However, these 15 communities operate on four separate radio frequencies, which makes it impossible for one officer to communicate with another who is on a different channel, even though both officers may be working in the same area and on the same problem. They need an additional frequency channel common to all members of the task force. Another problem which resulted from this mutual aid pact was an overloading of the frequencies which did exist. As a result, Chief Schaeffer said that:

> * * * the normal routine operations that were not committed to the task force suffered because we were constantly on the air.

He also said that the recent split channels in the 450 megacycles per second band had all been applied for, so none of these will be available for use by the mutual aid pact.

Mrs. Merle Solomon, supervisor of Grosse Ile Township, which is one of the members of the mutual aid pact, told the subcommittee that during the 1967 riot they sent a firetruck into downtown Detroit to help fight the fires. They were "completely out of contact with them most of the time" and, therefore, were unable to send in a replacement crew after the first 12 hours. Mrs. Solomon also explained that:

> We were more concerned when the city of River Rouge [also a member of the mutual aid pact] came under attack and we began to wonder what we would do if the riots were to spread into the downriver area and we might need to call them [their firemen and equipment in downtown Detroit].

Chief of Police John P. O'Reilley from Dearborn, Mich., stated that "communication certainly has played an important role" in the drop in the crime rate his city has experienced. He said:

> We have completely equipped our officers with the individual radios so that they are now never out of touch with headquarters regardless of whether they are in the patrol car or not.

Mr. Royce Smith, the local Sinclair fuel oil dealer and distributor in the Belleville, Mich., area, told the subcommittee:

> The people know that my trucks are radio dispatched, and that has been about the greatest asset that I have had to my business.

However, he said the congestion on his frequency was quite bad and caused delays in getting messages through. Mr. Smith, who is also the mayor of Belleville, told the subcommittee of one incident that occurred during the 1967 disorder which clearly showed the consequences of the congestion on land mobile frequency channels.

> A lady called in * * * and said there were four subjects running up the alley in back of this house. * * * I relayed the call to the Wayne County sheriff [but] * * * it took approximately 30 minutes for the call to get over the air so that the sheriff could get there. We have a monitoring station which is continually going. It was not silent a minute during that time. It had taken that call all that time to get over the air to send a car out there. It was about 10 minutes after I got the call that there was a house set on fire about three doors from where the call came from and due to the fact that Van Buren had one third of its volunteer fire department fighting fires in different localities, by the time they got there, the whole building was gone instead of just the garage of the house. If I had been able to immediately dispatch a car to that area, there is a good chance that we could have apprehended the four subjects that the woman called about that were in the rear of the house.

Mr. Richard A. Pinkston is the business manager of the City Cab Co. He told the subcommittee that:

> The area we serve now is so large that we should be adding more cabs to our fleet. The reason we don't is that we share our radio channel with five other cab companies, and there is so much frequency congestion I don't dare put any more cabs or any more units on the air.

The situation is so bad that Mr. Pinkston said:

> We refuse to take any more calls [for taxi service] simply because we don't have the airspace to put them out. My girls are sitting there getting about 200 calls and there is no frequency to put them on.

During the disturbance and curfew following the assassination of Dr. Martin Luther King, Mr. Pinkston said his cab company, in cooperation with the Detroit Police Department, provided fast, radio dispatched transportation for many hospital employees to and from their work. Some of them either worked or lived in the areas affected by the riots.

Mr. Theodore P. Rykala, an electrical engineer with the Michigan Consolidated Gas Co., described to the subcommittee how important land mobile radio was to the operation of his company and how frequency congestion due to a lack of channels has hindered their ability to render the fastest service to the public. He said that during the period of January 1, 1968, to April 1, 1968, the company received an average of 3,100 calls per day for work of an emergency nature requiring current day action. On heavy days the service requests of customers reached peaks of 5,300 orders of which approximately 10 percent involved the investigation of gas odors. "Radio communication, when available, also permits us to respond to all such odor complaints rather than attempt to determine the severity of it through conversation with the customer as had to be done in the days when we operated by telephone." Of the total number of requests for service, he said the company was able to dispatch an average of only 2,000 orders per day by radio, the remainder of the orders being dispatched by slower means. This limitation is due to the inadequacy of mobile radio communications channels for this use. "In order to respond properly to this number of service orders during peak periods, our present radio communications system will require three additional radio channels", he said.

The final witness to appear before the subcommittee in Detroit was Mr. Virgil R. Owens of the Detroit Edison Co. This company also uses two-way radio to dispatch emergency trucks to repair lines that are down and other causes of power failures. Mr. Owens told the subcommittee:

> During large-scale emergencies, because of the large amount of air traffic, it is much harder for the crews to relay back important information to the dispatcher. This results in a delay in restoring service to large areas.

Mr. Owens also observed:

> It should be noted here that storms, which are the greatest hazard to our power lines, are also a hazard to telephone lines. Telephones can be out of order when we need them most.

Finally, Mr. Owens described the role played by Detroit Edison during the riot by shutting off power in the strife-torn area when lines were down in order to protect the lives of the people forced to move around in that area. He also said:

> Many times when a repair crew was pinned down by gunfire they would use their radio to call for additional protection. Radio was a tremendous morale booster to these crews during the critical period.

On July 29, 1968, the subcommittee held further hearings in Los Angeles, Calif. on the allocation of the radio frequency spectrum. The first witness to testify before the subcommittee was the Chief of Police of Los Angeles, Thomas Reddin. He began by stating:

> We are frustrated by the FCC's allocation of the radio spectrum. We feel that there are much too few frequencies in the public safety services area.

Chief Reddin went on to tell the subcommittee that his department had tried to get additional spectrum:

> We have been attempting for 3 years to get a citywide emergency frequency which would be one for just emergency purposes. Despite our correspondence with Washington, despite our frequency coordination efforts with other agencies, and despite the expenditure of hundreds of thousands of dollars, we still do not have a citywide emergency frequency.

When asked whether his police department had sufficient radio spectrum space available to meet even their normal, everyday needs, Chief Reddin replied, "Our answer is emphatically no."

Deputy Chief of Police Noel McQuown and Capt. C. A. Kirby accompanied Chief Reddin and further described the critical need for more frequencies by the police department. They said that the department had attempted to get additional channels for tactical use, and finally they were forced to take them out of their own "hide" by simply increasing the congestion on other frequencies in order to clear two channels for tactical use. However, despite this, Deputy Chief McQuown said:

> * * * these [new] frequencies are already well overloaded. For example, during the disturbance that followed the assassination of Rev. Martin Luther King we found that those frequencies were so overloaded they were almost useless.

Captain Kirby brought with him a tape recording of the radio dispatches of the police department during the Watts riot. The tape was played for the subcommittee during the hearing, and, it was noted,

had no break in the voice or in the stream of transmissions during the entire tape. As Captain Kirby said, "We couldn't put another message in there if we had to. There is no break in the carrier and no break in the voice. It just continued this way for 5 days."

Mr. Darwin J. Nielsen, chief commanding officer of the Los Angeles Fire Department, described similar experiences relative to their use of two-way radios during the Watts riot. He said that at that time they were controlling 110 companies by radio and "the air was completely saturated and a large percent of the messages were unintelligible or never did get through." Chief Nielson went on to list some of the needs for additional frequencies which the department would have in the future. Among those he noted were communications facilities for breathing equipment, closed circuit television, mobile radio teletype, mutual aid among fire departments, and an alerting system covering the entire city.

Mr. Robert W. Russell, chief engineer and general manager of the Department of Public Utilities and Transportation of the city of Los Angeles, has the responsibility of providing for the communications needs of all of the other city departments. He stated:

> One of the key instruments in aiding local governments to achieve their goals has been the mobile radio. The ability of management and supervisory personnel to be in constant contact with their key field personnel and to immediately be advised of field conditions via mobile radio has, is now, and in my opinion will continue to show immense dividends to the taxpayer in the form of lower cost for his governmental services.

Data he provided showed clearly that the demand on the part of city agencies to employ two-way radio in their work has been constantly increasing. As a consequence, despite technical improvements and other measures taken in recent years to improve land-mobile spectrum usage, Mr. Russell said "We now find that the small portion of the electromagnetic spectrum which is allocated to land mobile use is highly congested in this area. We have, in fact, run out of spectrum space."

Mr. Anthony Gain, chief of the electronics division of the Department of Public Utilities and Transportation, also agreed that there was a critical need for more frequency spectrum. He told the subcommittee that the recent splitting of the 450 mc/s band would not help them solve their problems in Los Angeles:

> They split the 450's into 25. Statistically, it looks like you have more channels available, but they are not usable here. We cause interference with a 50 kilohertz separation between Los Angeles and Burbank.

Deputy Sheriff John Knox of Los Angeles County told the subcommittee that the frequency congestion problem is so critical that during times of emergency his men have been forced to resort to other means of communication than their police radios. For example, he said:

> We have used our RACES volunteers, using their amateur frequencies, to relay messages to patrol cars in disaster areas because our system was overloaded and was required to continue with routine work in the unaffected districts * * *.

Sheriff Knox also discussed the use of helicopters by police agencies to patrol around the clock. He felt it was "the singlemost innovative step in law enforcement since the use of two-way radio in a car began." Los Angeles County's first use of the helicopter to patrol the city of Lakewood was so effective that the crime rate actually went down there, while in surrounding areas it went up. Yet, Sheriff Knox said that they experienced interference problems on the helicopter's radio used to communicate with the ground units in the city.

Mr. Louis E. Ludekens, an electronics engineer with the Southern California Edison Co., called for meaningful relief from the existing congestion on the land-mobile frequencies and suggested how this might be accomplished. He said that the Land-Mobile Communications Council, which is an organization representing all of the mobile radio services, after many thousands of manhours in spectrum research, has proposed the following solution: Considering the need for short term and for long term frequency relief and different uses, and desiring to have a minimum amount of impact on other radio services, there should be allocated frequency space to the Land-Mobile Services from the existing UHF–TV allocations made 20 years ago and which today lie virtually idle across the Nation. This proposal would allocate the use of TV channels 14 through 20 immediately to the mobile radio services and gradually, in accordance with a timetable, by 1981 provide 42 megaherz of the spectrum for land-mobile radio relief in major metropolitan areas of the country. A further recommendation is made to allocate the spectrum at the upper end of the UHF–TV band to provide, in the long term, further relief for the Land-Mobile Radio Services, including the broad band common carriers use.

Mr. Arnold Klein is the owner of Modern Refrigeration Corp., which installs and services large refrigeration equipment in restaurants, hospitals, hotels, and schools. Both he and his customers rely upon the prompt service which communication by two-way radio makes possible. He stated:

> I feel that this single act [the installation of two-way radios] has done more to build our reputation and good service than any other individual deed. People know that they can rely on our being there when we say we will be. If our man is delayed for any reason, such as traffic, he can call in and give an estimate of the time when he will arrive and then we, in turn, can call the customer and explain the situation.

Mr. Klein said that recently he decided to change the channels upon which his radios were operating because of the long waits he was having to get through to his service trucks due to the fact that so many other businessmen used that same frequency, even though he expects this new frequency to rapidly become just as congested as his old channel.

The final witnesses the subcommittee heard were Mr. Aaron Kapp and Mr. Jerry Dobkin, who together have formed a job placement agency called Housekeepers Unlimited. Mr. Kapp told the subcommittee that every morning their bus drivers pick up women in the depressed areas of Los Angeles and transport them to the suburbs where there is work. These suburban areas were often inaccessible by means of public transportation, Mr. Kapp said. Prior to the installation of two-way radios on their buses, when an employer canceled out after the bus had left, there was no way to relay another work assignment to the woman needing work. Consequently, she would ride the bus to her destination only to find that the job did not exist. However, now with the buses equipped with radios, when an employer cancels out, the dispatcher can simply radio to the bus the address of another employer who wants a worker and thereby assure every woman who wants to work will have the opportunity. Housekeepers Unlimited has proven quite successful in meeting its purposes. As Mr. Kapp told the subcommittee:

> On several occasions the State welfare department has sent women over to us for jobs. This really pleased us because we knew we were helping to keep people gainfully employed who might otherwise have been on welfare.

Like other small businessmen, however, Mr. Kapp and Mr. Dobkin said they are also experiencing problems with frequency congestion and the delay it causes in transmitting calls for work to the buses.

The Chicago hearings on "The Allocation of Radio Frequency and its Effect on Small Business" clearly brought two main points into focus: (1) the continuing and increasingly worsening congestion in the land-mobile frequency spectrum available to the public safety services and small businessmen, and (2) the failure of the FCC's proposed rulemaking in Docket 18261 substantially to provide usable frequency channels which will eliminate that congestion.

The testimony of Comdr. William Miller, who is a member of the Chicago Police Department and president of the Associated Police Communication Officers of Illinois, exemplified the plight of the city's police. Recalling the riots in his city following the assassination of Dr. Martin Luther King, Commander Miller stated:

> Because at this time these disorders were widespread, and encompassed several districts—not only my own—and this widespread disorder involved many messages by both base and mobile units, it was impossible to get through to command and control headquarters by the use of radio.
>
> I was in the vicinity of the Chicago Stadium at Wood Street and Madison, and after repeated attempts to contact headquarters by radio, I noticed a street box on the opposite side of the street. By means of a patrol box key, I opened the street box, asked the district desk to connect me into command and control headquarters, and informed Director Miller, who was in charge of the communications at that time, that the only way to restore order would be to get the National Guardsmen off the trucks.

* * * * *

> Order was restored in this instance by the use of a communications system that dated back to the 1880's. This is when our street box first was put into Chicago.

The channel congestion was so bad at the time Commander Miller described that he said not only was he unable to use his two-way radio to call headquarters, but also he could not use it to call for assistance from other police in other districts, and he could not even use it to contact and direct his own men who were on duty at the disorder. "There were just too many radio messages on the air, both incoming and outgoing from these various locations throughout the city on this frequency," he said.

The following dialog between Commander Miller and Congressman Dingell illustrates the difficulties facing the police department in order to find a citywide command channel:

> Mr. MILLER. No, sir. There were approximately 530 units on two channels. We felt the need so forcefully for a command channel, we took the units off one of these channels and put all the 530 units on one radio channel.
>
> Mr. DINGELL. What is the optimum use for one channel? In other words, the optimum number of units that can effectively use one channel in ordinary times?
>
> Mr. MILLER. It depends on your day-to-day radio usage in your system, your procedure, but I would say a hundred on a channel.
>
> Mr. DINGELL. So you now have five times overuse in order to have the emergency channel. You had to crowd that channel still further.
>
> Mr. MILLER. That's correct, sir. This, of course, then precluded any real radio usage, except for emergencies on that channel.

Mr. Jay McClasky, chairman of the frequency advisory committee of APCO which under the FCC rules and regulations would be charged with coordinating the use of any new frequencies by the public safety services, testified concerning the need for the application of additional frequency spectrum for land mobile radio and discussed the FCC proposal in Docket 18261 which would permit the use of UHF Channels 16, 17, and 18 by land mobile radio in Chicago. He said:

> * * * the FCC docket indicates a power limitation of 50 watts effective radiated power, or ERP, and a maximum antenna height of 50 feet in the Chicago area. *This precludes the use of these frequencies by practically all States, counties, most cities, since it's not enough coverage.*
>
> * * * * *
>
> The city of Chicago will not be able to use them because they won't be able to get the coverage, the required coverage. [Italics added.]

The extreme frequency congestion facing the police departments in the neighboring suburbs surrounding Chicago was discussed by personnel from these departments. Edward J. Barcol, chief of police

at Brookfield, Ill., described how his police department shares a frequency with nine other communities in the area just west of Chicago. Edward J. Naydack, chief of police at Justice, Ill., described a very similar though more severe problem. The Justice Police Department must share its single frequency with 24 other police departments in the area. He stated that his police officers receive "* * * a lot of interference from different departments * * *."

Mr. McClasky described a situation south of Chicago in which—

> * * * there are 35 cities and towns with about 230 mobile units, all attempting to operate on one simplex frequency, one single frequency. That is too many towns.
>
> * * * * *
>
> If a base station transmits at the same time as a mobile unit in another city, why, it wipes out, or interferes with any, practically any of these mobile units that would be attempting to transmit at the same time.
>
> When you try and operate 35 base stations or 35 towns along with 200 mobile units—230 mobile units—it's just mass chaos.
>
> The confusion is just so terrific that squads have to repeat their messages, and they are certainly not doing their job. In other words, there are way too many units, towns, and mobile units operating on that single frequency.

With respect to the FCC's proposal in docket 18261 Mr. McClaskey pointed out that the Chicago urbanized area, to which the use of the proposed new channels is restricted, includes only a narrow strip of Lake County along Lake Michigan. Mr. McClaskey stated:

> * * * I will get very little benefit up in Lake County. These departments west of Chicago where they run 200 and 300 mobile cars per channel, they will get no relief * * *.

The radio technician for the Brookfield Police Department, Mr. Robert J. Hajek, agreed that to the extent these smaller cities were outside the urbanized area, or had mobile units operating outside that area, "* * * it would certainly appear that that would make you ineligible" for relief under this proposal.

Mr. Hajek also cited the power restrictions imposed on the use of these channels in docket 18261 as significantly curbing their usefulness to the small police departments:

> In addition, in the Chicago area use could be made under that docket of three UHF television channels, and due to the restrictions, basically they have them paired: two of them, where one would be used for mobiles, the other would be used for base stations; and a third, half of it would be used for base stations, and the other half for mobile.
>
> Well, when you pair together using the really restricted channel that has the most restriction on it for the mobiles, it allows you a 20-watt effective radiated power mobile unit, which is somewhat below the state of the art, and in rough

> calculations, it appears that you could get reliable communication to a base station only over a distance of from 4 to 5 miles, and even within the FCC wording of the docket, they make the comment, with respect to Chicago—which is, of course, where we are interested. All three plans indicate potential for land mobile relief in many areas; Chicago is a difficult problem under all three.
>
> So in essence, with all the restrictions placed on it, it's difficult to see where this generous offering is going to be of much use to anybody.

Both Commander Miller and Mr. Walter Key, the director of the electronics engineering division of the Chicago Police Department, discussed devices which could be used by the police if additional frequency spectrum was made available. Commander Miller said that, in order to prevent criminal elements in society from monitoring police radio broadcasts, and thus anticipating every move law enforcement officials make, a scrambling device could be installed in police radios. However, he explained:

> The use of a scrambler device I believe would require additional frequency.

Mr. Key detailed a number of "* * * uses for new frequencies which the Chicago police department would consider if they were to be made available." Among them were:

> The creation of one or more radio channels for the specific purpose of access to the department's computer.
>
> * * * [T]he allocation of video channels. At this time the department operates helicopters, which could easily be equipped with telemetry equipment which would allow the command personnel in our dispatching center to visually appraise a disturbance situation, and thus more effectively control the overall dispersal of personnel.
>
> * * * [T]he purpose of transmitting digital information, which could be used to control mobile teleprinters, or, better yet, mobile facsimile equipment. In my opinion, the restrictions which have been place on bandwidth do not permit rapid development and/or efficient design for this type of equipment.
>
> Additional frequencies are also required for the specific purpose of interconnecting, by radio, our department with other agencies who are brought in during major situations, such as National Guard, Army, et cetera.
>
> Radio spectrum is also required for essentially instrumentation purposes. Examples of these are vehicle locators, automatic surveillance devices, and alerting devices.

With respect to the "Handi-talkie," which permits each policeman to carry a radio with him at all times though he may be far from a squad car, Mr. McClasky, speaking for the Public Safety Frequency Allocations Committee, stated:

> This committee is, then, in the unique position of having to say, "Sure, sure, we think hand-carried [radio] is great,

> but we can't approve your incorporating it into your present system because of the interference it will cause."
>
> Or we can say "Sure, go ahead and incorporate hand-carried equipment into your system, but your neighbors are going to be unhappy at you and at us also, because they will have to increase their antenna height and transmitter power to compete against your strong signal, and they may even have to replace all of their mobile units with higher power units, just to stay in operation," which is a very bad thing.

Mr. Norman Biorn, who is with the Chicago fire department and chairman of the Coordinating Committee for Fire Radio Services for Illinois, noted the interference caused by the fact that both the city's fire equipment and ambulance service must use the same land mobile radio frequency, and he commented that when an extra-alarm fire occurs, it may be impossible to direct the men trying to control it if at the same time an ambulance has received an emergency call.

Mr. C. J. Smith of Chicago's department of streets and sanitation states:

> In the past, during times of extreme emergency, such as the snowstorm of January 1967 * * * we have had to curtail or eliminate normal operations [on our two-way radio] due to the one channel operation so as to properly control and dispatch emergency equipment and supervisory vehicles.

Henry L. Garrison, the manager of radio communications for United Air Lines, described the two-way radio in air terminals, and stated, "* * * the number of channels designated for air terminal use is inadequate for even the next 2 or 3 years".

Similarly, Albert L. Nemirow, who is in the business of installing and maintaining coin-operated laundry equipment in apartments, and who has equipped his service trucks with two-way radios, says the congestion is so bad on the radios that:

> At peak times we may have to wait 20 minutes to get our instructions out to the servicemen.

He also described how the congestion on the radio channels was hindering his ability to employ more people and to serve more customers:

> * * * I've doubled the number of my employees since 1965, and I could continue to grow at the same rate. However, these radio problems make it difficult to put on more people or expand into more new apartments, because I just cannot get messages to more servicemen without enough air time for my radios.

Mr. Nemirow said his business extends from Chicago to Zion, Ill., which is 40 miles to the north. Therefore, the FCC's proposal in docket 18261 will offer him little relief because the additional channels can only be used in the Chicago urbanized area.

Mr. Garrison, after describing the need for more frequencies for use in air terminals, concluded by stating:

> It is my opinion that this solution can only be the more equitable division of the radio spectrum among all those requiring its use; the public will receive inadequate service in many vital areas until those providing the service can improve efficiency through business radio.
>
> It is my further opinion that this solution is ready at hand by the release of channels which have been earmarked and frozen for particular services, but have been unused by those services.
>
> As an aside, in case that statement is obscure, in "earmarked and frozen," I am referring to UHF TV.

Mr. James Beloungy described the importance of two-way radio to the Illinois State Toll Highway Commission. Over 200,000 vehicles per day use the toll road. This means that in addition to about 150 State police radio equipped cars which patrol the road, it takes 250 radio equipped vehicles to operate and maintain the road, which is a complex of superhighways running from Indiana to Wisconsin and from Chicago to Rockford, Ill. Commenting on the recent splitting of the channels in the 450 mc/s band, Mr. Beloungy said that not only will the quality of two-way radio service needed by the police and maintenance staff deteriorate because of more interference and other problems, but it will cost the highway commission, and ultimately the taxpayers of Illinois, about $100,000 in order to convert just this one communication system so that it can operate on the narrower channels.

Mr. George L. LeMent of the Chicago Transit Authority testified that only the CTA's supervisory vehicles were now using two-way radios and these are in the low band, "which is very crowded, and subject to much interference" even though none of the city's 3,300 buses is yet equipped with radio. However, he said that he had observed the benefits of greater passenger safety, better employee relations, and improved operating economies when two-way radio had been installed in transit systems in other cities. Then he described a new automatic vehicle monitoring system to be tested by Chicago which would increase safety, improve scheduling, and permit the location of a bus in an emergency. He said that Chicago had applied to the FCC for frequencies upon which to operate this new system, and, even though it will require only half as many channels as would be required if all of the CTA buses were equipped with the normal two-way radio system, the FCC has been "squirming as to where they are going to get them (the frequencies)."

The testimony of Mr. DeMent underscored the significance of the testimony of Mr. O. Jack Chesterfield, manager of marketing and planning for the Detroit Department of Street Railways, who described the "tremendous service" which two-way radio makes possible in the area of public transportation in Detroit. Among the many benefits he described were the added security and protection which passengers and drivers alike felt when their bus was radio equipped. No longer was it necessary for the driver to leave the bus in order to report a disturbance. As an example, Mr. Chesterfield cited an incident in 1964 when a busdriver, who had been robbed and mortally

wounded, drove his bus searching for help until he collapsed and bled to death. "If the bus had been equipped with a radio, he would have been able to notify the radio control center and possibly obtained assistance in time to save his life," said Mr. Chesterfield. In 1967, when a similar incident occurred on a radio-equipped bus, driver Louis Thompson, though slumped at the wheel of his bus, was able to radio for help, and 5 minutes later he was on the way to the hospital in a police scout car which had been dispatched in response to his call. In addition, he had been able by radio to give a description of his assailant to police who were able quickly to apprehend the man.

Two-way radio also permits more accurate scheduling of buses, faster maintenance to those which break down, and consequent better service to riders, according to Mr. Chesterfield. If a bus is delayed en route, the driver can radio his dispatcher who can in turn reschedule other buses so that passengers desiring to transfer to another bus need not miss their connection.

Mr. Chesterfield also told the subcommittee of the need they had for additional frequencies in order to equip the rest of their buses with two-way radios. He explained that the DSR provides bus service for 10 miles beyond the city limits, and that it also operates 1,200 buses in the six-county area of southeastern Michigan. As much of this need for public transportation is outside the Detroit "urbanized area," it will not be benefited by the FCC's latest proposal for additional frequency spectrum for land mobile radio.

Another witness who had appeared before the subcommittee would have a similar problem. He is Mr. John P. Nelson, manager of Superior Ambulance Service. His company provides ambulance service throughout all of Wayne and Washtenaw Counties in Michigan and relies on two-way radio to dispatch an ambulance to pick up an injured person and then to transmit the details of his condition to the hospital while they are en route so that a medical team can be ready when they get there. Mr. Nelson said that they had recently moved to a different frequency because of the congestion they were encountering, and he explained that if congestion continues to be a problem on their new frequency they will again be forced to switch channels at an added cost to the public. As much of the area served by this ambulance service is outside the Detroit "urbanized area," it, also, will not benefit by the FCC's recent proposal.

Chief of Police Gene E. Welch, of Allen Park, Mich., described the need for an additional channel which would enable them to coordinate their law enforcement efforts with those of their neighbors outside the Detroit "urbanized area" without the necessity of everybody using the same channel in an emergency. An example of the problem this creates was given by Chief Welch.

> If there was a bank robbery in Wyandotte and if the chase were through our community, our patrol cars would hear that and we could set up the roadblock system, but under the present system, they could be through before we could establish a roadblock. We like the togetherness, but we would like to have the fact that when they have an emergency, of being able to switch to another channel so as not to eliminate or knock * * * (them) from the use of the radio * * *.

The need for additional frequency spectrum in the Detroit area was also explained by Mr. R. J. Evans, a member of the Michigan Public Safety Frequency Allocation Committee. He told the subcommittee that they had been searching for channels to update the use of walkie-talkies by the police and that the new 450 megacycles split frequencies would be "virtually useless" in the city of Detroit. He stated that:

> the Committee, in searching the 35 new assignments, was only able to find four that could be used by the city of Detroit because of intermodulation problems with existing stations 25 kilocycles removed or with interference between antennas installed on top of tall buildings.

He explained that because these new frequencies are only 25 kilocycles away from regularly licensed business radio systems, if the police attempted to use these frequencies, they would overload the business users equipment and conversely, the business users would overload the police radio equipment. The net result would be that "neither of us would operate," he said.

Chief of Police Robert P. Owens of San Fernando, Calif. has a unique jurisdiction in that it is completely surrounded by the city of Los Angeles. "From the view of the small city police administrator," he said, "the real need is for a sufficiently flexible radio system to permit expansion in the forthcoming years of existing radio systems." He explained that he is now working with a committee of law enforcement officials which is trying to design a countywide radio system which will permit police helicopters patrolling the county to communicate with police cars from each jurisdiction in the county.

Mr. Glenn M. Green, an electrical engineer, appeared on behalf of the Los Angeles Department of Water and Power, which uses two-way radio to dispatch repair crews when there is a power failure, frequently at a time when telephone service in the area may be interrupted by damaged lines or is otherwise not available; rush aid to those injured in field locations; coordinate wire stringing over streets and freeways; and coordinate the operation of valves and switches during construction and maintenance of water and electrical distribution systems. Mr. Green pointed out the serious consequences to the public when an emergency caused by a power failure arises. He said that business and manufacturing generally comes to a virtual halt. "Dead are cash registers, gasoline pumps, refrigerators and freezers, elevators, traffic signals, computers, and most manufacturing processes, including film processing, baking, plastics extruding, oil refining, pipeline pumping, and many others." At such times, it is essential that repair efforts may be directed as rapidly as possible, unhindered by frequency congestion. He said that normal growth and additional uses for two-way radio would be "handicapped by lack of radio channel availability" in the future. He also said that he does not believe channel sharing can be a solution to this problem because:

> Although channel sharing is feasible and is practiced in many instances, there are times in the operation of water and electric systems when immediate and extensive radio communication becomes indispensable. Sharing fails at these times.

Mr. Don Egermayer of the Automobile Club of Southern California testified that this affiliate of the American Automobile Club was responsible for the road emergency needs of over 1,537,000 individuals who operate one out of every five cars in southern California. When a member needs emergency roadside service, a radio dispatched truck is sent to his aid. According to Mr. Egermayer, "these radio-dispatched service vehicles can literally run two calls against one for trucks without radio which must return to their station to pick up the next call. It is obvious that the time saved in serving club members benefits all motorists by quickly relieving blocked traffic lanes." However, due to frequency congestion he said approximately one-third of their calls cannot be dispatched by two-way radio. Since the channel splitting in the 450- to 470-megacycle band did not result in any additional frequencies for automobile emergency services, Mr. Egermayer left the subcommittee with the question,

> Where does that leave us in planning for the undeniable tremendous future needs for two-way emergency road service communication?

THE ALLOCATION OF RADIO FREQUENCY AND ITS EFFECT ON SMALL BUSINESS

Conclusions

The committee has been impressed by the fact that there is no method of communication as effective as land mobile radio in meeting the needs of a wide variety of small businessmen in the operation of their businesses, as well as in meeting the needs of the police, other State and local government services, and other businesses, which protect or otherwise serve the small businessman and the public generally. The committee finds that it is also equally clear that while broadcasting has continued to attract the popular interest, the development of land mobile radio, in the words of the FCC, in its 1950 annual report "has had an equal, if not greater, public impact" than broadcasting because it affects not only the means by which people communicate with each other, but also the means by which they travel, earn their livelihood, conduct their business, insure their safety and happiness, and obtain efficiently, and at a lower cost than would otherwise be possible, the goods and services they use.

Unlike much of the other use which is made of that portion of the frequency spectrum between 25–890 MHz, land mobile radio is used to serve the public from the cradle to the grave in each local area of the country. The catalog of its uses in the public interest is almost unending. For example, it is used to dispatch repair crews to restore breaks in electric, gas, water, and telephone service; and without electricity even the ever-present gasoline pump in the service station and the elevator in an urban building would be inoperative. It is the means by which the fuel oil dealer can get a message to one of his trucks out on the road concerning an urgent fuel delivery which must be made, or a plumber can be directed to a new job where his services are needed before he has driven all the way back to the shop. It is also the means by which the headquarters can direct the nearest policeman to the scene of the accident or crime which has just been reported, and the means by which the fireman inside a burning building can communicate with the fire chief directing the crew outside the building. In the case of a city bus robbery, it is used to summon help. Even the taxi, returning from one call, is dispatched on another call to the door of a member of the public by land mobile radio.

Unfortunately, it is clearly apparent that congestion exists today in the small amount of frequency spectrum now allocated for land mobile radio use and that the public is being denied many of the benefits which land mobile radio could provide because of the limitations which this congestion places on the use of land mobile radio. Indeed, the committee finds without question that every day in a countless variety of ways the use of land mobile radio serves the

small businessman and the public generally, and that it is essential in the public convenience, interest, and necessity for ample, additional, usable frequency spectrum to be allocated without delay for this means of communication.

Ample frequency spectrum, in this context, means ample spectrum to meet both the regular and emergency needs of the users of this form of communications because it is in times of emergencies that the need for such communications is the most urgent and important. As the record clearly indicates, during times of major disturbances such as riots, the need of the police for communications between headquarters and the policemen on the street not only increases in volume; it is of the greatest importance in reducing and containing areas where trouble is about to erupt, or has erupted. At these times, the number of calls the fire departments must meet also increases greatly, and the demands on the gas, water, telephone, and electricity repair crews to shut off services to prevent fires and explosions, or to reroute service in order to bypass damaged areas, are much greater. A wide variety of businessmen also find the calls for their services increase not only in number but in seriousness at such times. The ambulance company and the plumber, who must deal with broken gas and water pipes, are but two examples. The glazier who must repair or board up the broken storefronts, and the private watch and protection services are other examples of such businesses.

The needs of the public also continue during times of such emergencies. People must be fed and kept warm. The delivery of milk and other food and fuel oil must be continued, but with the trucks in constant communication with their offices so as to be directed around areas of possible violence. The committee has only to call attention to the testimony of the fuel oil dealer who pointed out the danger of a truck loaded with fuel being attacked by rioters for the seriousness of the need for communications adequate to avoid this type of situation at such times to be apparent. Similarly, the never-ending processes of birth and death, and illness, do not stop during such civil disturbances, or during natural disasters such as blizzards and floods, and this makes it essential that ambulance services, funeral directors, and even diaper delivery services be able to carry on their work.

It must not be forgotten that during times of major disturbances or disasters, people may be restricted to their homes either by curfews or by snow or floodwaters and it becomes increasingly important that efficient and effective arrangements be made to bring the goods and services which people need to their homes, not only because they cannot go out to obtain them, but also to reduce the amount of travel in the streets at such times. As the committee learned, taxi and livery companies receive an overwhelming number of calls for transportation at such times, and many users of this type operate in close cooperation with the public safety officials to utilize their vehicles only for the most urgent calls. The committee wishes to emphasize the fact that the need of the public to be served by the wide variety of uses of land mobile radio may well be greater during times of civil disturbances and natural disasters than at other times and require an expanded rather than contracted use of communications by land mobile radio users if the public interest is to be properly served.

Ample frequency spectrum also means ample spectrum to allow for innovation, in order that the public may have the benefit of such

new uses, new equipment, and new techniques as may be developed for land mobile radio. There seems little doubt that the public is presently being denied the full extent of the benefits which land mobile radio could provide today because of a lack of frequency spectrum to encourage such development. If adequate frequency spectrum is made available, these new uses, equipment, and techniques will provide better law enforcement for our cities and rural areas, better State and local government services, and better service to the public from businesses at a lower cost than could otherwise be achieved.

Testimony presented to the committee has repeatedly emphasized two points concerning the amount of frequency spectrum which must be allocated to the land mobile radio services to adequately serve the public interest. First of all, witness after witness has said that when he first began using land mobile radio he had little or no congestion resulting from an overloading of his frequency channel, but that congestion had steadily increased because "not only has my organization grown and my use of radio grown along with it, but more users are using radio than before." Second, witness after witness said that he could not take advantage of all the ways he could use radio to serve the public better because the congestion in the portion of the spectrum allocated to land mobile radio prevented a greater, effective use of his land mobile radio system.

In the committee's view, the fact that it is essential that the frequency spectrum which is allocated must be usable, and that it must be allocated without delay, means simply that it must be suitable for equipment which is in use today or which can be made quickly available. As one witness, the director of communications of New York City put it, "the hole in the street is now," and the frequency spectrum he needs for communications which are necessary in the public interest to get that hole repaired now must utilize equipment he can buy today, not equipment which must still be developed. As the committee uses the term "without delay," it means that the FCC should take every possible step to insure that its action is not further delayed.

In making its findings the committee has given consideration to the testimony of witnesses representing the commercial broadcasters and to material submitted by such witnesses.

It is evident that there is a substantial amount of UHF frequency spectrum which, although it is allocated to television, is presently unused for television and would remain unused under the facts as they now exist even if the lowest seven UHF channels were completely allocated to land mobile radio use. Indeed, it is clear from the report of Land Associates, commissioned by the National Association of Broadcasters, that any gain in program diversity decreases so rapidly with more than three television stations serving an area that there may be questionable justification for the large number of TV assignments in and around major urban areas, many of which are in the UHF band and do not contain operating stations. That report also commented:

> What should be noted, in addition, is that the proliferation of similar program types that occurs when stations are added beyond three, consists largely of material already seen earlier on the network affiliates; that is, the so-called off-

network, rerun programs of the situation comedy, quiz and game, adventure-drama types, along with feature films.

and

The great bulk of the ETV allocations are going begging.

The committee is also aware of the fact that there have been suggestions by reputable radio engineers that it may be possible to narrow the present 6 MHz TV channel to 3 MHz, and thus make a substantial amount of VHF and UHF spectrum available for other uses if it should prove too difficult to provide for the allocation of the lowest seven UHF channels to land mobile radio.

The Federal Communications Commission is commended for their action in commencing the two proceedings to determine whether that portion of the electromagnetic radio spectrum currently allocated to ultrahigh frequency television transmission should be reallocated in part to land mobile radio (FCC docket No. 18261 and docket No. 18262). While these two proceedings are less than definitive, they do signal at least a commencement of awareness by the Commission of the very serious problems confronting land mobile users and the public, which is dependent upon their services. It is to be noted that in docket No. 18262, the Commission states in paragraph 9, "The Commission is persuaded that the burgeoning needs of the land mobile service can be met on a long-term basis only through the allocation of additional spectrum space to that service. * * *" This is undeniably true. It is likewise hard to fault the Commission's statement that "* * * At this point in time it is agreed generally that frequencies below about 1000 MHz are most useful for general land mobile application. In looking to frequencies above 806 MHz for the accommodation of the land mobile service, the Commission recognizes that it will not meet immediate requirements and that several years of developmental work may be required to establish a viable service. * * *" Conversely, the relief contemplated as the central strand of docket No. 18261, the awarding of the lowest seven UHF channels to land mobile could, if properly delineated, afford immediate relief.

It is the conclusion of this committee, after studying all available pertinent facts, that relief is long overdue for land mobile users, and that the public interest urgently requires prompt alleviation of this rapidly deteriorating situation. Further, it is clear that the radiospectrum being as it is a public resource should be available in an amount ample for their needs, as a matter of right, to the many divergent small business interests and the members of the public whom they serve, no less than commercial broadcasters. It is recognized that such uses as law enforcement, fire protection, and similar public protection uses must be afforded sufficient spectrum to protect the public. Subject to this qualification, however, it is clear that small business and other land mobile users are fully entitled to equitable participation in the allocation of this vital resource. Some spokesmen for commercial broadcasters have taken pains to belittle the tilization of land mobile by small business interests implying that business radio is for the b sinessman's convenience and profit only. This is most unfortunate.

Commercial broadcasters quite properly have as their ultimate goal the making of a profit from their operation. In a free enterprise society, this is not only proper, it is indeed the very rationale for their being, the compelling reason for the investment of capital in the physical equipment used by the broadcaster. This, of course, is subject to the broadcasting operations being carried on in a manner that provides a public service. However, land mobile users also utilize the radio spectrum to better serve their customers, and hopefully to carry on their operations in a more economic fashion, thereby resulting in additional profits, better service, and a savings to the consumer. In terms of the profit motive, both commercial broadcasters and land mobile users utilize the spectrum to enhance their profits.

It would appear improbable that most spokesmen for the commercial broadcasting interests would care to engage in a debate wherein they would argue that even the typical prime time fare offered over television today better serves the public interest than the more efficient dispatching of an ambulance, a fuel oil truck, a powerline maintenance wagon, or similar unit. Indeed, one would be hard pressed to imagine a more disadvantageous comparison which might be undertaken by commercial broadcasting spokesmen than that comparing the social utility of the second rerun of "I Love Lucy" with the typical land mobile operation.

THE ALLOCATION OF RADIO FREQUENCY AND ITS EFFECT ON SMALL BUSINESS

Recommendations

1. It is recommended that the Federal Communications Commission press forward with all possible vigor to completion of the proceedings under docket No. 18261.

2. The committee recommends that docket No. 18261 should not be confined to an examination of only the unassigned portions of the lowest seven UHF channels but should include a thorough examination of all uses presently permitted on the lowest seven UHF channels in determining the relief to be granted.

3. It is recommended that the Commission during the pendency of docket No. 18261 not permit the filing of any new applications for any assignment within the lowest seven UHF channels.

4. It is recommended that should the Commission fail to provide adequate relief for land mobile users, that the Small Business Committee as constituted in the 91st Congress hold hearings at the earliest practicable date to ascertain the cause of such failure.

5. It is recommended that should the next succeeding Small Business Committee find it necessary to hold hearings contemplated by recommendation No. 4, that its hearings also address themselves to the recommendation made by the President's Task Force that the spectrum management function be shifted to another entity within the Federal Government.

○

THE IED/EIA RESPONSE

To

The Federal Communications Commission Docket 18397, Part V

The Future of Broadband Communications

submitted to the FCC on October 29, 1969

This submission was prepared by an Ad
Hoc Committee of The Industrial Electronics Division

INDUSTRIAL ELECTRONICS DIVISION
ELECTRONIC INDUSTRIES ASSOCIATION
2001 Eye Street, N.W.
Washington, D.C. 20006

Before the

Federal Communications Commission

In the Matter of	)	
	)	
	)	
Amendment of Part 74, Subpart K, of the Commission's Rules and Regulations Relative to Community Antenna Television Systems; and Inquiry into the Development of Communications Technology and Services to Formulate Regulatory Policy and Rulemaking and/or Legislative Proposals.	)	DOCKET NO. 18397, PART V

The Industrial Electronics Division, Electronic Industries Association, is pleased to submit the following comments on Docket No. 18397, Part V.

William J. Weisz
Chairman
Industrial Electronics Division
Electronic Industries Association

John P. Thompson
Chairman, Ad Hoc Committee
FCC Docket 18397, Part V
Industrial Electronics Division
Electronic Industries Association

John Sedolski
Staff Vice President
Industrial Electronics Division
Electronic Industries Association

October 27, 1969

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BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
Washington, D. C. 20554

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SUMMARY - WHERE WE STAND

1.0 The Industrial Electronics Division, Electronic Industries Association (IED/EIA) views the services to be provided by broad-band communication networks in the late '70's and early '80's of landmark importance. We look upon such systems as being of "national resource" dimensions and the development of these resources as a national goal.

We visualize the services for all our broad-band communication networks that in aggregate will far transcend current entertainment television via cable in importance to the American public, business, and industry.

IED/EIA concurs with the predictions offered by the Commission in Paragraph 8 of the Notice that the services listed there are both feasible and desirable and encompass a wide range of potential applications. It also agrees with the suggestion contained in Paragraph 9 of the Notice[1] that is technically feasible and in the public interest to establish interconnections among the various local broad-band communications networks to provide regional or national systems for rendering the services under consideration in Part V. We believe that earth-satellite relaying (both point to point and broadcast) will play an interesting role in the future of broad-band communication systems.

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1. See Appendix, Page 37, Item 1

In our comments, following, we attempt to add support to these basic positions:

2.0 With regard to implementing these new services, the Division strongly suggests that the Commission choose a route that will assure minimum disruptions of present public communications services and maintain the performance and growth of present data, voice, and record services.

Towards these ends, IED/EIA suggests that the Commission provide a regulatory environment which will allow the development of two types of broad-band communication networks in the United States, as listed below:

First, a video telephone system which may be quite similar to the proposed "PICTUREPHONE"* system of AT&T described in depth in the May-June 1969 Bell Laboratories Record. The two-way video network should have additional, but optional features:

a. The ability to act as a video output terminal with limited keyboard access to computers, and

b. Transmission and reception of high-speed (e.g., one-second per page) facsimile information.

Second, a broad-band communication network (BCN) that would, in effect, be a minimum 300-megahertz bandwidth "pipe" to provide many information services for home, business, and the government such as broadcast video, first-class mail, and educational material, plus others listed in this filing. The BCN should provide limited return bandwidth for receiving and tabulating specific requests and responses by individual users of the cable or cables.

We suggest that to the extent possible, each system be allowed to develop, utilizing the creative energy of free enterprise with enthusiastic encouragement from

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* Registered Service Mark, AT&T

government and industry.

As discussed in the introduction and life styles section of our report, these broad-band systems will have a profound effect on our way of life in the United States in the '80's.

3.0 In the opinion of IED/EIA, it is too early to set specific industry standards. As an industry association experienced in the field of standards, we will of course stand ready to establish appropriate technical standards when patterns of approach appear to be jelling. In this period of early development, the Commission should encourage the testing of new innovative systems and service concepts to assist in determining ultimately optimum systems.

4.0 Only the transmission plant (both the switched video telephone networks and the broad-band communication network) should be regulated basically through local structures. Interstate interconnections may require national regulation. The information services carried by the broad-band communication network should not be regulated nor should the attachment of all associated terminal equipment required for providing such services be regulated.

I. INTRODUCTION

1.0 The Potential Impact of Broad-Band Communication Networks on the National Ecology, Social System, and Standard of Living.

Eighty percent of the people in the United States live on less than 10% of the land area. No other vertebrate congregates in such masses as man -- it's not natural. Man has tended to cluster in cities because at the time of the industrial revolution, these areas were the sources of energy (coal, water, and electricity). With the advent of broad-band communication networks, man will have the opportunity to live in significantly less dense population centers - in more rural areas and yet have the tools available to communicate for business, entertainment, and sociological purposes.

It is particularly interesting to note a historical parallel to the opportunity before us in communications. At the turn of the century, electricity as a national resource started to develop. Here was a better way to move, at low cost, massive amounts of energy from central sources for the individual plants and

homes where it was needed. Broad-band communications via cable are in a similar early state of development - only now we are talking of moving at low cost, large amounts of information from central sources to the individual plants and homes where it is needed. If we are to learn lessons from the past, we must also note the character of the early growth phase of electricity.

The electrical industry had a wide variety of starts. New York and other cities were wired first with DC and until the mid-60's there were still many sections of the United States with 50 cycle power and 25 cycle power. However, as the industry developed it became apparent that the most efficient distribution systems would use 120 volts 60 cycle systems. And this system has now prevailed. But the growth of the electrical energy would not have been anywhere near as rapid if early constraints in the form of untried standards or protection of the status quo had been applied.

Broad-band communications is the tool not only to provide a means for new styles in human settlements, but also to rebuild, in a sociological sense, the crowded inner core of major cities. Broad-band communication systems using cable can be structured to promote small, self-determining communities within the massive megalopolis. Through these, city dwellers can find order, identifiable territory, community pride, and opportunity to participate and vote on matters that can be of local option -- education, cultural pursuits, recreational interest, etc.

Such wide-band systems in the 1980's appear to IED/EIA to be an absolute necessity if the nation is going to find real solutions to national pollution, urban traffic, and inter-city transportation problems. These systems which would allow many persons to work at or near their suburban homes. They would alleviate, in a major way, each of these problems which are continuing daily to become more and more serious.

In part V of Docket 18397, the Commission has cracked the door to a new world. We urge that it now be opened wide to wholly new approaches by bringing the full capacity of broad-band communication networks into national service at an early date.

2.0 Method of Preparation of Filing

In organizing our studies to provide a meaningful response to Part V of Docket 18397, it was first necessary to forecast life styles in the late '70's and early '80's. Then, based on the needs of the home, business, and government at this time, we designed services to meet these needs. Subcommittees were set up to analyze both the life styles of the late '70's and early '80's and services. A technological-economic subcommittee was organized to determine the technical and economic feasibility of the services required, and lastly, a subcommittee to propose a regulatory environment which would allow such services to become available to the public in an optimum manner.

The positions taken in this response to FCC Docket 18397, Part V have been arrived at by the representatives of diverse industry interests, in an attempt to detail the best interests of the public and this industry's service to the public. The positions must be considered as consensus positions in which not every member of IED/EIA concurs on all points. Where member companies are filing individual responses, they will, of course, stress those policy considerations that they believe to be of particular significance.

A number of meetings were held of the subcommittees to analyze their data and to report to the total group. The filing represents the results of these meetings over a period of more than six months by representatives of a number of electronic manufacturers and guests who were present at and who addressed the meetings.

3.0 Filing Description

Our filing is structured around our expectations of the future life styles, and services which would fulfill these life styles. The technological feasibility of these services is then reviewed followed by the economic support for the hardware and software required. Lastly, the proposed regulatory environment is discussed.

We then attempt to answer those questions that we suggested as a first phase analysis of broad-band communication requirements in our filing of June 4 on Part V of Docket 18397. These questions are Number 1 and 2 on page three of the filing, and Numbers 1, 2, and 3 on page eight of the filing.

II. SOCIO-ECONOMIC ENVIRONMENT (Life Styles in the Late '70's and Early '80's)

The world of 1980 will be the result of developments in the economy, the geopolitical arena, and in social patterns during the intervening decade. These factors will influence and be influenced by the development of technology, with a spectrum of new "services" becoming available to business and to the individual by 1980.

The concept of a "managed" economy free from prolonged recessions as developed over the last decade should function equally well over the next. With reasonable increases in productivity, the ability of an affluent society to purchase non-essential but highly desirable communications services seems assured. The business community of 1980 may find operations fiscally unsound if they do not utilize advanced communications services as a major thrust forward for improved productivity in the service segment of the economy.

The primary effect of the geopolitical patterns on the world of 1980 is expected to be economic. A continuation of the Vietnam War to 1980 does not seem reasonable, but the maintenance of effective détentes with major powers may be a requirement. Substantial funding will probably be diverted from the external conflicts to internal wars on illiteracy, malnutrition, underemployment, urban decay, and a deteriorating environment. The thrust of effort in 1980 is expected to be toward a substantial improvement in opportunities for the disadvantaged with commensurate increase in the demand for communications services.

There are many social patterns now developing which can significantly affect the demand for broad-band communications services in the 1980's. Those social patterns expected to create significant demands for services possible through the availability of wideband communications networks to the business community, educational institutions, local and federal government, and to the average homeowner are:

1. Work activity - speeding information flow (e.g., mail)
2. Communication - providing for interactivity with computers
3. Transportation - untangling travel congestion
4. Life support - combatting crime, urban congestion

5. Education/culture - extending availability and support

6. Recreation - providing variety in entertainment to the home

7. International business - sharpening our competitive edge

1. WORK ACTIVITY - SPEEDING INFORMATION FLOW

Problems expected to result from a congestion of local and national systems for the free and rapid flow of information essential to the conduct of business, education, government, and home activity may be equally as serious as those deriving from crime and the urban crises if alternative means are not applied before 1980.

The cost of paperwork created by business in the United States is estimated at tens of billions of dollars annually. Should this more than double within the next decade as expected, this mass of paper will be sufficient to block communications channels as they now exist. If we assume a continuing proliferation of Third Class mail to consumers superimposed upon the business volume, it bccomes apparent that physical transfer as we now know it will become impossible.

The analysis of the content of the U. S. mail made by Arthur D. Little, Inc. for the Kappel Commission provides for the first time an insight into the changing character of the mail in the United States. The conclusions are summarized below:

(a) What's In the Mail?

Fraction of total mail volume consisting of:

Transactions..... 40%

(Mail containing a check, money order, bill or statement of account, purchase order or question about an order)

Advertising..... 26%

Correspondence..... 22%

Personal..... 13%
Business..... 5%
Government..... 4%

Magazines and newspapers..... 11%

Merchandise..... 1%

First-class mail consists principally of transactions and correspondence, comprising together 62 percent of total mail volume. From the above figures, one

observes that transactions (business-to-household and business-to-business) are 65 percent of the first-class mail volume.

(b) Senders of Mail

Fraction of total mail sent by:

Business..... 73%

Business to household..... 47%
Business to business..... 26%

Households..... 21%

Household to household..... 14%
Household to business..... 6%

Government..... 6%

(c) Recipients of Mail

Fraction of total mail-volume received by:

Households..... 64%

Businesses..... 33%

Government..... 2%

(d) Local Mail

The distribution of local mail from business senders to households is:

Local..... 33%

Same state..... 60%

Out of state..... 40%

The fraction of all mail that originates locally is 33 percent on a national basis. In New York City, which is the headquarters of so many businesses that deal directly with the public (banks, department stores, credit card organizations, etc.) the percentage of local mail is at least 50 percent.

The primary impact of the above will be on the U. S. Postal system. It has been estimated that at present growth rates, over 108 billion pieces of mail excluding checks, will be handled annually by 1980. Delays and transportation bottlenecks both short and long haul are expected to develop in spite of automation and transportation improvements. This will foster the development of soft transfer systems with greatly increased use of facsimile. By the late '70's these devices should be in wide use.

These will require a substantial degree of broad-band communications capability on a nationwide basis.

The use of computers has largely been confined to in-plant operation, but time sharing of centralized computers is now becoming a widely accepted practice. The next phase of the development is expected to be greatly increased use of communications channels to tie high-speed computers together. Broad-band networks will be vital to these functions.

The use of Management Information Systems is expected to proliferate rapidly in the mid '70's. These systems will rely heavily upon access to computers on site or remote, and upon rapid storage and retrieval of data from huge information banks. Multi-divisional plants will require extensive use of communications networks capable of high-speed information exchanges combined with the facility to transfer the "human image" by videophone and accessory graphic devices. This will create a significant demand for inexpensive wideband data channels due to the aggregate volume anticipated.

The financial community estimates that before 1980, we should be conducting almost all our fiscal operations, business and private, without the interchange of money or paper. In this fiscal utopia, the non-transferable, uniquely identifiable credit card becomes all important. While a simple card may suffice for small ordinary business transactions, it is expected that a valid signature will still be required to commit large fundings. Large complex orders or instructions, e.g., waybills, with a high information content, will require a hard copy to validate. Facsimile affords a simple means for essentially error free transmission of signatures and data. High degrees of degradation in output quality can be tolerated before a signature or number becomes unrecognizable. A single bit error in alphanumeric transmission may result in huge errors.

A related problem, the automatic transfer of stock without the need for certificates, is already serious. A degree of computerization is already being effected. A "soft" stock transfer system should be functioning long before the checkless system, probably by the mid '70's.

The proper functioning of all soft fiscal transfers will require the esta-

blishment of huge data banks. These will contain personal data on credit, business fiscal data and complete data on ownership of securities. Data will be fed into these storage systems at all levels from the simplest Touch Tone* telephone to the interchange between storage banks. Much of the information will be accumulated at central points for subsequent transmission of high data rates. This requirement, plus the "talk" between data banks, will create large demands for high data rate broad-band communications.

By 1980, the development of interactivity will foster the application of man-machine systems for shopping, banking, self-educating, and utilization of information services from the home. These computer-like display devices will require the use of a wideband communications network for distributing data from a central source to a community of users. Every user is to have the capability to select or control the information desired by means of a narrow band link back to the center of distribution. These services can only be supplied by an equivalent to current CATV distribution systems modified to provide narrow band transmission capability back to the "head end."

2. COMMUNICATION - PROVIDING FOR INTERACTIVITY WITH COMPUTERS

The proliferation of computers, although progressing at a slower rate in the late '70's will result in a total installed value of computers at about $100 billion by 1980. The ubiquitous computer will be essential to efficient operations in business, scientific, and educational institutions. By 1980, home computers will be a luxury item in the more affluent homes.

The exposure to interaction with a computer will have started at an early age as the education process becomes increasingly computerized. Members of the scientific community will become so dependent upon computer assistance that they can no longer function efficiently without interacting with a computer. Business management will be making extensive use of Management Information Systems by 1980. Complexity of the interactions plus sheer volumes of data will make preprocessing and mass storage of data essential. Astute managers will be confining work to a rapid monitoring

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* Registered Service Mark - AT&T

of operations with on-line manipulation of decision alternatives to achieve optimization of management actions. The acceptability of the interactive process in education, science, and business will lead to the utilization of the technique at home, initially through a time sharing, but subsequently, with small computers. A status syndrome similar to that relating to "Lincolns or Cadillacs" should develop and increase the consumer use of computers.

The result of these developments is expected to be in the birth of an "interactive society" by 1980. Interactivity with a computer will become a way of life and an increasingly important status symbol. As post 1980 generations develop, they may be so highly dependent on the computer that scratch pad calculations will no longer be used. Creative composition directly with computers is a distinct possibility. The effect in 1980 will be a society with a rapidly growing appetite for computer based devices with attendant broad-band communications requirements.

3. TRANSPORTATION - UNTANGLING TRAVEL CONGESTION

Projections of air, interurban rail, truck, and automotive transportation growth indicate strong possibilities of saturation before 1980 unless massive improvements are accomplished. Air travel is even now on a marginal basis with perturbations caused by weather or controller slow-downs resulting in substantial airport congestion and delays. Normal growth in air traffic will require abnormally fast growth in airport and airway facilities to compensate. At present rates of progress, this does not seem possible. New interurban systems offer promising opportunities to offset local automobile congestion. The construction of effective systems such as BART require many years to complete, extensive fiscal resources, and such projects are fraught with political problems. Only a few will be in operation by 1980. Highway construction has barely been able to meet the growing traffic volumes. Future funding is expected to be minimal with a growing tendancy toward saturation. By 1980, alternative means to the individual use of automobiles will be utilized such as piggyback freighting and highway towing systems to minimize the number of vehicles.

The result of congestion of airways, railways, and highways will be the use of trip alternatives, with an increasing load on facilities caused by the need for communication in support of travel. An effective alternate to travel by any mode will

be the extensive use of communications facilities to create "pseudo-trips." The videophone is an example of a communication system capable of substituting for "physical" travel. The effectiveness of video telephone travel can be extended by adding facilities for transmission of documents, handwriting, sketches, and detailed drawings. Communications systems needed to untangle traffic congestion will add considerably to the use of existing telephone services but will impact most heavily on the use of mobile frequencies where congestion is already a serious problem.

4. LIFE SUPPORT - COMBATTING CRIME AND CONGESTION

The rapid increase in crimes of all kinds is one of our most serious national problems.

Crime statistics of the last decade show no signs of abatement in rates of growth. While crime against poverty exhibits the largest increase, all serious crimes continue a growth trend.[2] The President's commission on law enforcement has indicated that "Age, urbanization, and other shifts in the population already under way will likely operate over the next five to ten years to increase the volume of offenses faster than population growth.[3]

The ability of local law enforcement agencies to cope with the growing incidence of crime can be expected to decrease steadily, unless alternative means for supplementing the man on the beat can be applied. The application of modern electronic techniques for surveillance and detection will provide this supplementation but only if the electronic devices are systematically interconnected by broad-band communications networks.

Over the next decade, the technologies of telecommunications should provide increasing support to deal with national and local crime problems. Items such as facsimile pictures of criminal elements randomly accessed to facilitate rapid identification, and closed circuit video scanning of streets, merchandise, vaults, etc.,

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2. Refer to Dept. of Justice, Federal Bureau of Investigation; annual report, "Uniform Crime Reports for the United States."

3. Task Force on Assessment, the President's Commission on Law Enforcement and Administration of Justice, Crime and Its Impact - An Assessment, U. S. Government Printing Office, Washington, 1967.

are two illustrations of the needs of broad-band service in this area. This activity should be developing both within the public and private sector.

De-urbanization of the central city not only causes degeneration within the core, but also creates a mass exodus to suburbia of all those affluent enough to escape.

By 1980, 100 million, or 40% of the 250 million Americans, are expected to live in the suburbs of metropolitan areas. Ninety million, or 36%, are expected to live in small towns and rural areas. Only 60 million, or 24%, will live in the central parts of the large metropolitan areas.

From the business point of view, the suburban population will be by far the most important as it is expected that the residents of the suburbs will earn about 50% of the total family income in the United States.

The suburban areas should have the highest share of the better educated population. This group is expected to fill the professional and executive positions. By 1980, the suburbs should have more than one-half of total discretionary purchasing power in the United States.

The exodus to suburbia will develop new centers for communication as new concentrations of activity develop outside the central city core. This will result in greatly changed communications patterns affecting all media. As an example, newspapers will be printed in the suburbs where local advertising can be more effective and local news of births, marriages, and deaths is of community interest. One probable development will be the growth of remote printing centers. These will be located in the suburbs and connected by very broad-band communications networks to the center city newspaper office. These will be transmitted by high-speed facsimile to the suburban centers, each of which will add the "local" content and print. Time will continue to be the most valuable of commodities to newspaper publishers and wideband facilities a certain requirement.

5. EDUCATION/CULTURE - EXTENDING AVAILABILITY AND SUPPORT

In a recent testimony before a Congressional Committee, John Henry Martin, Superintendent of Schools in Mt. Vernon, New York, testified that "public education

is the last great stronghold of the manual trades ... in education, the industrial revolution has scarcely begun."

The gist of this testimony and opinions held in the U. S. Office of Education and in the National Education Association's Audio-visual Departments are that teaching is still being done in the same way in which it was done centuries ago: A teacher standing in front of the class lecturing and using the textbook as the principal teaching tool supplemented occasionally by audio-visual aids to demonstrate or illustrate the subject being taught. As a result, teaching remains probably the only present day occupation in which, in spite of rising salaries, productivity and output not only have not increased but because of reduction class sizes have substantially declined.

To date, education has not been typified by rapid acceptance of new technological advances, such as programmed teaching and computers. A major weakness of their development has been lack of knowledge about how people learn and how computers can be used effectively in education.

However, the survey conducted by the National Education Association in the spring of 1967 also ascertained which <u>one piece</u> of audio-visual equipment not now readily available to teachers they would like for use in their classroom. It indicated an increasing awareness of the need for the most modern instruction resources presently available, television and programmed instruction material. A significantly higher percentage of the teachers sampled also expressed a desire for computers than for the conventional audio-visual devices, film and film strip projectors, or photographs.

The slowly developing trend toward the application of computer aids to education should have a significant impact by 1980. Increased federal funding, plus a more progressive attitude on the local level, are expected to result in a substantial demand for equipment and supporting communication services by 1980.

One of the primary assets of a communications system capable of conveying 20 or more channels of video information is in making available a wide selection of culturally stimulating programs. The availability of broad-band communications net-

works should lead to the production and use of program material with a cultural orientation. And since the incremental cost for using one or more channels on a properly engineered cable system is virtually non-existant, such cultural programs can be repeated at many different times to fit a wide variety of personal preferences.

6. RECREATION - PROVIDING ENTERTAINMENT VARIETY IN THE HOME

A gradual increase in leisure time is expected as work efficiency at home and in the office is improved by interactive and other electronic aids. This will create new demands for entertainment. The backbone of entertainment will continue to be television coverage on a larger scale than present. This will provide a vital economic base which makes all other uses of broad-band communications from a home interactivity center possible. As for something "new", participation in novel activities becomes a distinct possibility when an "interactive terminal" allows an individual at home to communicate visually and orally in real time. Chess, bridge, bingo, and a host of other leisure time activities should be possible.

7. INTERNATIONAL BUSINESS - SHARPENING OUR COMPETITIVE EDGE

Competition from rapidly developing foreign industrial nations can be expected to continue. Essential to the growth of productive power for any nation is an effective communications network. Japan has an effective communications system and is already laying groundwork for a video telephone system. L. M. Ericcson in Sweden has just started videophone tests. Germany can be expected to be a leader in the creation of broad-band networks which will improve their production efficiency. The early adoption of broad-band communications for improving our own business operations may be critically important if we are to offset foreign expected competition. It will be a vital requirement if we are to hold our share of world markets.

III. NEW SERVICES FOR A BROAD-BAND COMMUNICATIONS NETWORK (BCN)

1.0 Broad-band Communications

We visualize new services for BCN's that in aggregate will far transcend entertainment television via cable in importance to the American public. In the following comments we shall attempt to outline certain of these new applications. In some cases the need is clear, the technology is at hand, and the economics are

demonstrably favorable.

The terms "CATV" for community-antenna television and "CTV" for cable television fail to do justice to the potential of the communication medium. The characteristic that is common to the entertainment services so far established and those considered in Part V of Docket 18397 is that all employ a wide-band non-radiating communication network. It is all too easy to equate wide-band transmission to conventional television, for that is the one only known and widely accepted example.[4] Some of the classes of future service to be discussed will bring out the narrowness of such a definition. Nevertheless, for brevity we shall use the term BCN in our discussion here to represent the transmission means for all classes of such service.

IED/EIA agrees with the predictions offered by the Commission in Paragraph 8 of the Notice that the services listed there are both feasible and desirable and encompass a wide range of potential applications. In our comments, we shall attempt to add support to this viewpoint.

2.0 Who Receives the Message?

A little thought as to the nature of human communication shows that there is a single originator of the message but the recipient may be an individual, a small chosen group, or a large inchoate audience. The originator may be a person, an organization like a broadcaster, or even a computer. It is essentially a single entity speaking with a single "voice." We may typify it as a person. The distinctions among the various services rest in the differences in the recipients or "addressees" rather than in that of the senders.

The terms (1) "discrete-address point-to-point service," (2) "multiple-address point-to-point service," and (3) "broadcast service" bring out the differences to which we refer. Familiar examples of the three types are a phone conversation, a professor lecturing to his class, and the President addressing a radio audience.

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4. Just as lighting was the first basis for generation and distribution of electricity, who could have predicted all the ways in which we now use electricity?

3.0 Switched and Non-Switched Services

Separating services into "switched" and "non-switched" types is yet another method of distinguishing the various classes of electronic transmission services.

A switched service (or system) is one in which messages originated by a sender are sent only to designated addressees. A switched service may be circuited switched where a direct transmission path is established between sender and receiver or message switched where messages are relayed to the receiver by switching centers in a store and forward manner. Multiple address is available with most switched services. However, multiple-address is considerably more common with message switched services than with circuit switched services.

In non-switched services, the communications channel remains unchanged and all messages are sent to all receiving stations. However, measages can contain addresses so that the receivers can select (i.e., display and/or print out, etc.) desired messages. By using presently available digital technology great flexibility in addressing can be provided so that each receiver can be given an individual (discrete) address. The sender can then select the desired receiver(s) by sending proper address information with messages. Multiple-addressing can be accomplished by sending each discrete address of each receiver or by establishing and sending a code that designates a class of subscribers.

Regarding the question of privacy, either network, switched or non-switched, can enjoy any desired degree of privacy that can be economically justified.

Perhaps the foremost of the switched services for picture transmission is PICTUREPHONE system now under development by the Bell System. Other broad-band switched services for data transmission are provided by U. S. and other common carriers and are in widespread use. All these are well known to the Commission and need not be discussed here further. The remainder of the comments on future services will be limited mainly to the non-switched broad-band services using non-radiating networks.

5.0 Selected Examples of New Services

The service catagories discussed in Sections 2.0 and 3.0 allow us to arrange in a systematic scheme a number of services that will utilize BCN networks. Table I is such a listing.

TABLE I

TYPICAL NEW BCN SERVICES

Type of Addressee	Non-Switched Network (BCN)	Switched Network
Discrete-Address Point-to-Point Service	1. First-class mail	1. Video telephone
	2. Library books	2. Computer data exchange
	3. Business or personal status data and transactions	
	4. Merchandise displays and information	
	5. Press services	
	6. Composed publication material	
	7. Computer data exchange	
	8. Protection and surveillance service	
Multiple-Address Point-to-Point Service	1. Third-class mail	1. Video telephone conference calls
	2. Selected visual data (by category) of limited public interest	
	3. Classroom instruction material	
	4. Press releases	
Broadcast Services	1. Entertainment television	
	2. Audio-visual educational material	
	3. Audio material such as news, background music, advertisements, or lectures	

TABLE I (Continued)

TYPICAL NEW BCN SERVICES

Type of Addressee	Non-Switched Network (BCN)	Switched Network
Broadcast Service	4. Visual data of general interest	
	5. Selected visual data (by category) of general interest	
	6. Newspapers and magazines	

Three examples from the list of Table I will be described in more detail to illustrate cases where the need and usefulness of the service already appear to us to be evident. These are (1) an electronic mail service for first-class mail, (2) a home library service, and (3) a facsimile data service.

5.0 Electronic Mail Service

The feasibility of transmission of letters and documents by facsimile over a TV circuit and at rates of 15 to 30 pages per second was demonstrated experimentally[5] over twenty years ago.

A short time later recording from a cathode-ray tube by a dry electrophotographic process was also achieved. More recently, prototypes of low-cost facsimile recorders as noted in Section 5.1 have been devised.

One can visualize an electronic mail system for first-class mail in which the service will be developed in two successive stages: an initial intra-city service using BCN facilities and later a nationwide service probably using earth satellite relays for interconnections of the individual BCN nets.

One may examine the intra-city system in more detail. It will be referred to as BCNX. In a city, local mail can be posted in an "electronic mail box" on the street, in an apartment building, or in a business office. An exact copy is then

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5. Bond, D. S. and V. J. Duke, "ULTRAFAX," RCA Review 10, 99 (March 1949).

reproduced in the addressee's home or office within minutes, even at peak periods of traffic.

The sending station or scanner is connected by coaxial cable[6] to the local central office. There may be one office in a small town and many in a large city. One office may serve a population of 50,000 persons. In each office there are video buffer storage units, a data processing unit or computer incorporating a central address and coding memory file, and a traffic concentrator. Outgoing circuits feed the BCN network in one or more of its wideband channels.

At each home or receiving office, the facsimile recorder is connected to the BCN network just as is done with a television receiver. The coded address causes the recorder to operate automatically for the duration of the transmission and produce a "hard" copy folded and sealed automatically for security and ready for hand delivery to the ultimate recipient.

The need for a radical improvement in postal service in the United States was been stated by the Kappel Commission.[7] Their report points out clearly the crisis in the Post Office. It proposes the establishment of a public or quasi-public Postal Corporation and full application of modern technology.

BCNX service can be competitive in costs with the present postal rates. It is economically attractive to the home user provided he uses the facsimile recorder for other services to which it is well adapted.

6.0 Home Library Service

The principal elements of the BCNX electronic mail system can also provide a new service to the home or business user. This may be called the electronic home library service (designated BCNL). With such a service available a reader can request a book or periodical from a large central library, using a narrow-band channel to the library (a phone circuit or the BCN network itself.) The desired book is then "trans-

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6. This may comprise the BCN itself if two-way transmission is provided.

7. President's Commission on Postal Organization, "Toward Postal Excellence" Government Printing Office (June 1968).

mitted" from microfiche, microfilm, or video tape, page by page, and received via the BCN network on a dedicated wide-band channel.

Several modes of operation are possible. In one, the entire book or selected article is transmitted at the maximum reception speed of the user's facsimile recorder. Several hundred simultaneous transmissions in time-division multiplex are possible with 6-MHz BCN channels and reasonable recorder speed.

As an alternative, a soft-copy display can be used. Each page is transmitted and stored at the receiver for reading. When the reader has finished one page, he signals for the next page, and this is transmitted in a small fraction of a second with no perceptible delay. This is another form of time sharing of the broad-band channel.

To get a feeling for the capacity of a broad-band channel, it is of interest to note that in the demonstration described in Reference 5, the entire text of "Gone With the Wind" was transmitted in facsimile over a television microwave circuit in slightly over two minutes.[8]

In its early stages a library service would undoubtedly be limited in quality of the recorded images. The goals of graphic arts quality, color reproduction, and other refinements will gradually be attained as technology advances and as public demand develops. BCN offers a favorable transmission medium in band width and propogation characteristics for such growth in image quality.

7.0 Facsimile Data Service

Another potentially important service utilizes the same recorder equipment in home or office as for types BCNX and BCNL but provides selected visual data by category. This service, to be designated here as BCNH, differs from those just described in several respects. The material transmitted in facsimile (hard or soft copy) is selected in advance by the sending organization (e.g., broadcaster) for its interest and appeal to either limited groups or wide population segments. The user

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8. The Library of Congress encouraged this demonstration of a means of making its vast collection available to every U. S. citizen. The public showing was given at the Library in October 1948.

selects the desired category and receives promptly up-to-date but generally brief material on that one topic. Each item may consist of one or several pages of text and illustrations and is transmitted repeatedly at frequent intervals. Each such item bears a category code. The user sets the decoder in his recorder to select this code, and when the material is transmitted, the receiving unit is automatically started up to receive the facsimile transmission.

In one experimental arrangement, this system has been multiplexed with a broadcast television transmission, the facsimile signal being transmitted during the vertical blanking period. Field tests with which the Commission is familiar have been conducted during the last several years on Channel 4 in New York City and have demonstrated compatibility with television and the technical feasibility of this facsimile service.

It must not be inferred, however, that the selected visual data service must be associated with a television transmission and must use the vertical blanking interval. Far greater freedom of choice of transmission standards and quality of recording is available when CATV facilities are available. Channels reserved exclusively for this service can give large numbers of categories of data, improved image quality and size, or greater transmission rates.

The technical feasibility of the facsimile data service we described here is widely accepted. The public acceptance has not been demonstrated, since an equivalent service does not now exist to provide a measure of the need. The reader will note the parallel to the case of the telephone demonstrated by Bell at the Philadelphia Centennial Exposition in 1876; no one then saw any need for such a device. Elsewhere in these comments we discuss the range of subject matter and the potential educational, cultural, and utility value of such an information service in the home or business.

8.0 The Role of the Computer in Broad-Band Cable Networks

Community antenna television or cable television as employed up to this time is characterized by its "single entry, multiple distribution" feature, wherein a subscriber's only control over the CATV network is to turn his receiver off or on, and select one of the number of channels offered for viewing and listening. Under

existing systems, material available to the subscriber is usually limited to the following:

a. Normal broadcast TV programs which are captured by a single high-capacity antenna and piped to individual receivers.

b. Local program origination, such as local athletic events, town meetings, local news, etc.

c. Special information services such as weather reports, stock market, etc.

Again, the "single entry, multiple distribution" characteristic of such systems limits the amount and type of material available to the subscriber and requires only a few channels -- usually not more than ten or twelve.

The mushrooming growth in available information and the demand for access to this information is bringing about a revolution in communications which will produce a profound change in the way society is structured and in the way we live. These changes will be evident in business practices, in the management and operation of our homes, in our educational systems, and in our off-time recreation. One of the most significant changes in communications systems will take place in cable networks, where these networks will be coupled to computers and where the computer, as a communications device, will provide a virtually unlimited access to information sources for all subscribers in relation to their needs and within their ability to pay. The computer, functioning as a message switching device will operate as an intermediary between people and information sources. Through broad-band channels and time-sharing a subscriber may receive and store printed information for later use while simultaneously conducting a business transaction, for example, a transaction with his bank. The need for businessmen to travel for conference purposes will be materially reduced through face-to-face conferences conducted over computer switched networks. Appropriate supporting data for such conferences will be provided on call through computer selection and manipulation of data available at one or more terminals throughout these networks. In the home, the housewife will be able to do her comparative shopping without leaving her kitchen, and the children, through computer-aided instruc-

tion may conceivably receive the bulk of the education at home. In the entertainment field, a subscriber may, through the computer, ask for a program that is of particular interest to him -- perhaps a stock review or a library book. In this type of environment the distinction between a privately subscribed or a public communications system will be difficult to describe.

These new BCN-computerized systems will provide a greater degree of open-endedness than anything known today. They will render more services and will foster a highly increased interactivity among people, within communities, and back to information sources and media.

IV. TECHNICAL ASPECTS OF BROAD-BAND CABLE NETWORKS

1. The Basic Communication Channel

Coaxial cable is the usual transmission medium in CATV systems. It is also used very widely in other broad-band communication installments and it is likely that much more will be used in the future.

The cable attenuates the signals, therefore, amplifiers and equalizers have to be spaced out regularly along the cable if the level of the signals is to be maintained (Figure1). Since each repeater degrades the signals slightly, there is a limit to the number which can be cascaded and a corresponding limit to the length of the spur, depending on the quality of the cable. With existing CATV equipment, the limit is about 15 miles for a system carrying 12 TV channels -- but trends in the technology will certainly extend both the distance and the bandwidth in years ahead.

2. Multi-Channel Video Technology Appreciation

It is recognized that bandwidth and distance, which are required for multi-channel video plus the other contemplated services, have no other common counterpart. In the telephone networks in this country great care is taken to keep each video channel separate. Nowhere else are bandwidths approaching the 300 MHz level available. The so-called wideband microwave systems have 10 to 15 MHz bandwidths and the L-4 system has 18 MHz. In 1973, the L-5 system is planned for 60 MHz. Presently, cable television transmits multi-channel video 8 to 10 miles. (Some buried systems go 15 miles - that is stretching it with today's commercially available hardware.) Other

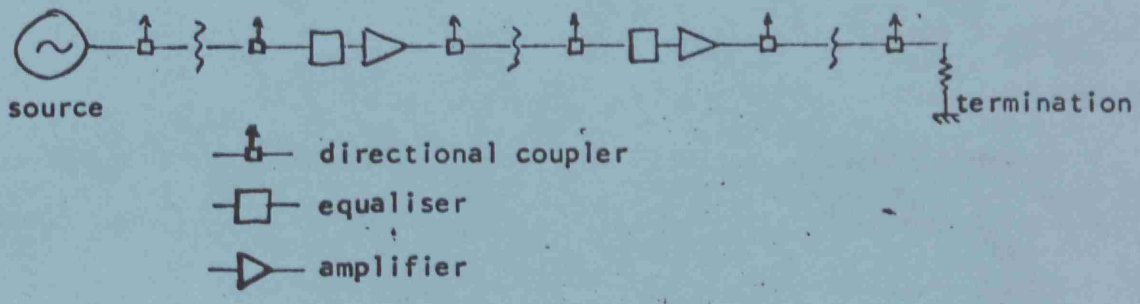


FIGURE 1. Basic cable spur.

cable video systems, like the Telco studio to transmitter A2A and equivalent are limited to one television channel per cable pair.

3. Two-Way Operation

Some two-way services can be provided at a reasonable cost in the type of broad-band system being considered -- although until the advent of digital systems it will be hard to ensure privacy.

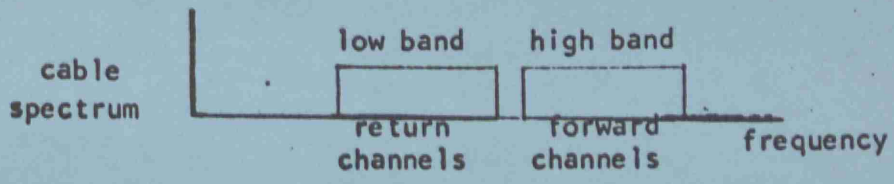
The anticipated return services have this form: a number of users require a facility for sending messages to a prescribed common plant. A sufficient number of channels would be set aside for this purpose in the broad-band system to which the users are connected. When a user wishes to return a message, his connecting unit would search through the return channels until it found one vacant. This channel would then be marked with the user's individual code signal during his message. Suitable electronic connecting units are practical, but they would cost much more than the directional couplers used for one-way communication.

Because the total return channel capacity might have to be divided among many messages being sent out at once, it is expected that in the near future only a narrow band will be made available for each. A separate cable could be used for return messages. Another solution places both forward and return channels on the same cable using different spectrum slots. (See Figure 2.) Only two bands should be used, for simplicity, and the industry would benefit if it were to establish an early agreement on this and other aspects of cable "spectrum" allocation.

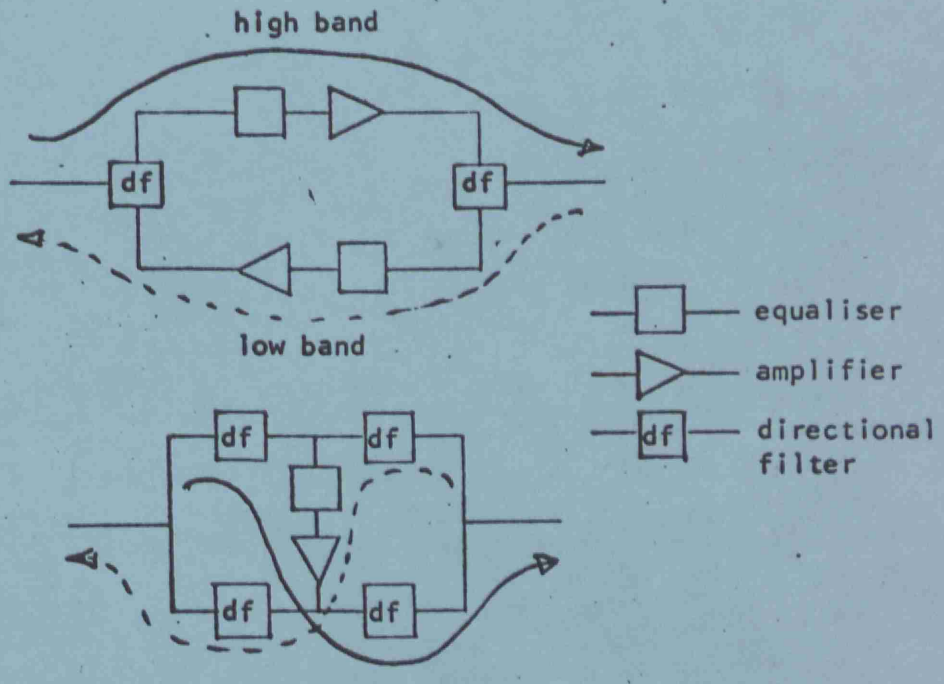
4. Service Requirements

A general classification of present and anticipated services is shown in Table II.

Good reliable service is likely to do more to stimulate the growth of the broad-band telecommunications industry than a direct attempt at growth by over-eager cost-cutting. The simple methods of v.h.f. frequency-division multiplex used by CATV operators is well suited to local broad-band service, but it has the characteristic that noise increases and overload margins decrease in proportion to distance along the cable from the head end. It is possible to design and operate a cable sys-



(a) Typical cable spectrum for two-way service.



(b) Alternative repeater configurations.

FIGURE 2. Two-way working.

tem of this type so that minimal degradation is perceptible to any subscriber, but there is a real risk of non-uniform service.

TABLE II

The Present View of Non-Radiating Basic Services

Classification: A available readily

B available less readily, expected to develop

C planned to become available shortly

D expected to become available before 1980

CIRCUIT	NOMINAL BANDWIDTH	HOME	EDUC. & IND.	HOME	EDUC. & IND.
teletypewriter	.3 KHz	A	A		B[4]
voice	3 KHz	A	A		
facsimile	4 KHz to 10 MHz		B[2]	D	B
video telephone	1 MHz + voice	C[3]	C[3]		
NTSC TV	4.2 MHz + sound		B	B	B
data	40 KHz and up		B		

NOTES:

1. Classification is by bandwidth and expected principal use; other types of signal also will be used.
2. High-quality audio channels are offered by the common carriers, but they are expensive and have few users.
3. Restricted networks of video telephone service could also be provided in local broad-band systems. It is expected that they will use PICTUREPHONE standards.
4. Some one-way channels could be provided through sub-channels in existing cable (or radio) broadcast services - e.g., in existing f.m. radio channels or by sharing the flyback time in NTSC television channels.

It may be technically difficult to define and maintain standards for TV and other services, but it is desirable that the industry should do so. Superior engineering and technical progress will be encouraged by such a step. It will ultimately lead, for instance, to digital systems with inherent uniformity of service.

5. System Configuration

The IED/EIA would like to underscore the generic difference between the projected coaxial cable broad-band communication networks and the narrow band tele-

phone networks. The telephone network is optimized and designed for random point-to-point voice interconnection and communication.

BCN's are designed for distribution of information from one source to many receiving locations. The network is like a "tree" with a main trunk and many branches. Separate "trees" could economically serve separate communities of as few as 1,000 homes. Separate "trees" could build neighborhood communities within massive urban centers. The several trees could be coupled to some common distribution channels and also could choose to tap into separate specialty program sources or interactive meetings, or games such as each community might desire. By starting with basically small "trees," we can obtain the most flexibility in providing services that are of interest to a few local communities or to the whole nation.

6. New Tools for New Services

6.1 Facsimile Recorders

Facsimile techniques are very old, and apparatus has long been in commercial use. But only recently has it become certain that low-cost facsimile recorders can be built for use in the homes of the general public. Such units employ various types of dry recording material. Special cathode-ray tubes can provide means to "print out" broad-band information (high resolution - highspeed) if desired.

6.2 High-Speed Coders

Comparatively simple digital circuits now permit coding and decoding for addressing transmissions to a specified recipient. Likewise new developments provide privacy of the message itself. The importance of coding for non-switched networks was discussed in Section 3.0.

6.3 "Soft" Displays

Several means have been developed for storing a selected frame of a television picture and displaying it on a screen. A number of new services can take advantage of this store-and-erase technique. It can be used when the addressee is to read a page or examine a picture or drawing, but where there is no subsequent need to store a permanent or "hard" copy.

5.4 Earth Satellite Relaying

A CATV network is essentially local in character. Many of the future services will require intercity links extending across the continent or overseas. Broad-band relays employing satellites in earth-synchronous orbit are particularly suitable for such interconnections. An addition, in sparsely populated aress where BCN networks are not economically feasible, the new services may be supplied directly to homes or business locations by high-power controlled-coverage satellites. The technical feasibility of direct television broadcasting is now widely acceptable.

7. New Channels

Although coaxial cable is clearly the basic medium for new broad-band services, microwave and millimeter wave radio and wire pairs will also find uses. A wire pair can carry only one video channel, given a practical degree of equalilization, but microwave and millimeter wave offer bandwi ths potentially as great as cable. We cannot expect to use radio indiscriminately because it is a radiating system, but it is appropriate at present for relaying a few TV channels to many users where cable-laying is difficult. In the near future, it will probably be practical to relay 12 TV channels or more, but radio is likely to remain too expensive for two-way working and rural links.

V. ECONOMIC SUPPORT FOR SERVICES AND TECHNOLOGY

The money to support a broad-band communication network is dependent on the general economic environment and the alternate technologies of the period. Continuation of current trends, particularly in crime, mail, and transporation may provide significant impetus for new services.

The economic development over the next decade will be determined by activity in several areas.

1. Fiscal and monetary policies will be directed toward the maintenance of high levels of employment and growth while avoiding an unacceptable rate of inflationary price adjustments.
2. The shape of the population distribution will be adjusted as

children of the post-war birth rate boom reach maturity.

3. Trends in education development will result in the emergence of a more highly educated labor force with increased earning potential.
4. The increasing role of the service sector will continue with upward impacts on both employment and demand.
5. The re-thinking of national priorities will cause an increase of expenditures for civilian programs.

The overall growth of the economy between 1969-1979 should be similar to that for the preceeding decade the current gross national product expanding at about 6.3% annually. This is slightly lower than the 6.5% rate during the 1958-1968 time-frame and would result in a GNP of approximately $1.7 trillion in current dollars by 1979.

The impact of the economic outlook on telecommunications relates directly to trends in incomes and expenditures for each sector-business, government and personal. In the personal sector, disposable personal income will continue its past growth rate of 4.1% in real dollars per annum. However, a greater portion of this income will become discretionary. As incomes rise, a smaller portion of total expenditures is required for basic necessities -- food, clothing, shelter. One impact will be an increase of personal consumption outlays for services.

Within the service areas of education, personal business, and medical care are expected to exhibit larger than average growth. Recreation leisure time activities and entertainment will continue their growth trend at 6.0% per annum. The current dollar level for activities with which new services would have to compete is approximately $45-50 billion per annum (includes recreation, private education, foreign travel, purchased transportation, and miscellaneous).

Now, overall, a switched two-way video telephone service can be expected to cost around $6-10 thousand per station investment and a BCN in current pipe communica-

tions runs about $240 per home.[9] Assume for the moment, that one video telephone will be required for each 100 office phones and that 50% of the nation's homes will be wired for BCN. This would represent an investment of $13 billion for video telephone and $11 billion for BCN service or approximately $4 billion per year cost. With this facility we could look for offsetting savings in these areas:

Domestic air travel	- over $6 billion per year
Highways	- over $6 billion per year
Police protection	- over $3 billion per year
Fire protection	- over $1 billion per year
Post office	- nearly $6 billion per year
Recreation	- over $28 billion per year
Total	- over $50 billion per year

BCN and switched video facilities could certainly be expected to offset the annual increases in several fields by providing labor saving (or capital savings in the case of roads) alternatives.

VI. REGULATORY ENVIRONMENT

A. Regulatory Suggestions

1. The public interest can best be served currently, in the immediate future, and the long run by preservation of free, open, and effective competition for the communication services that are and will become economically feasible where broad-band cable systems are installed. To insure this development, there should be a clear distinction between the communication service (CATV, video telephone, mail, and data communications, etc.) being offered the public and the transmission medium (broad-band cable system) which carries the communication service.

2. The transmission plant (broad-band communication network) is similar to many public utilities or common carriers in that it would tend by virtue of its dedi-

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9. It is recognized that the costs shown would not apply to relatively low density areas. However, this does not constitute an impediment to overall development as supported by the parallelism to electricity already noted.

cated investment cost to be exclusive in a given geographic area, as this has been true of most CATV franchises to date. Note, however, that it is only the transmission plant that tends to be non-duplicating and not the communication service such as CATV. The broad-band communication facility would tend to have public monopoly characteristics and thereby should be regulated, but only to the extent necessary (1) to insure equitable access to all desiring to offer a communication service, and (2) to protect the right of attachment of associated terminal equipment, and (3) to insure competitive purchase of necessary hardware. These communication services and associated terminals should not be regulated anymore than other information media are regulated -- such as newspapers, magazines, books, movies, etc. This situation is similar to the Carterfone case where the clear distinction was drawn between the terminal equipment and the common carrier facility. This decision has and will continue to encourage the application of new technological resources from potential new suppliers to help solve the numerous communication problems.

3. The profit potential available to those who can successfully foresee and plan to meet the communications needs of the private and business sectors will attract the human resources and risk capital necessary to solve these problems. This will only be true if there is a free, open, and effective competition.. The regulation applied must insure such an atmosphere not restrict it.

The BCN and switched video network should come under local regulations. Federal participation (agency regulation or new legislation) should be limited: (1) to insure separation of the broad-band communication facility from the communication services, and (2) to protect the public from radio frequency interference, both to and from the cable facility, and (3) to regulate interstate interconnection of local communication facilities. Paragraph number three above will insure compatibility among communication services on the same cable as well as enable interconnection of two or more local communication facilities. Thus all existing or new interconnecting communication entities such as COMSAT can thereby compete for the interconnecting services. Basic equipment standards should be established by the industry to assist in these areas.

B. Methods of Introducing New Broad-Band Cable Services

The IED/EIA holds the view that the public interest will be best served for the immediate future by permitting tests of different systems or services by different entities in various cities to afford some basis in experience before any particular system or service becomes established on a widespread basis.

Industry should be allowed maximum freedom for experiment and establishment of pilot services to give to industry and the public the opportunity to test the service and then to enjoy its benefits if indeed they are found to exist.

IED/EIA believes that the electronics industry itself should take the initiative in establishing appropriate technical standards, such as the need for compatibility and interconnection of various systems.

It will only be through open "real world" controlled testing of new systems and services in a free competitive environment that the best interest of the public can be objectively determined. These tests/experiments where of a non-proprietary nature should be coordinated through industry committees to be sure the information, tests, and interpretations of technical, social, and economic information are collected in an orderly manner.

It seems inappropriate at this time to generate a complete detailed master plan. However, certain areas should be guided at the start to enhance experimental planning and fostering a nationwide manufacturing capability. These should be adopted and firmed up later.

Some obvious areas are:

- Cable spectrum planning for potential service offerings
- Microwave interconnection plans (see attached)
- Interfaces agreements
- Reliability goals as a function of component outrage vs. customers affected
- Continuity and control pilots on systems

Field experiments leading to good reliable service are likely to do more to stimulate growth of the broad-band telecommunication industry than a direct attempt

at growth by eager cost-cutting. The BCN subscriber is entitled to the same kind of guarantee of performance as someone who leases a voice or data channel from a telephone company or other utility service offerings. It is believed that open experimentation and innovation in a competitive environment will ultimately encourage superior engineering.

VII. ANSWERS TO QUESTIONS PER IED/EIA FILING, JUNE 4, 1969

QUESTION 1. What is likely to be the nature of the services that could be offered to the home or business under present and anticipated technology, and how would home and business requirements for communications facilities differ in the light of services that might be economically practicable only for business use?

ANSWER The nature of the services that can be offered to the home and business are described in Section III of this report.

Differences in Service Between Home and Business

Currently, one key requirement of the home as opposed to business is a 4-6 megahertz video channel. In addition, the home tends to lend itself to the "multiple-address" point-to-point service and "broadcast service" as described in Section III, Paragraph 3.0 of this report.

On the other hand, business, without question, requires "discrete-address" point-to-point service.

We expect these clear differentiations between the services required in home and business to disappear in the late '80's. For example, as management and employees are able to move their offices into their homes, all services will be required in the home.

Likewise, as the demands of business communications increase in the mid-to-late eighties, we can foresee full video bandwidth channels being required by business.

QUESTION 2. Would the public interest be best served for the immediate future by:

a) Permitting or encouraging the entry of all would-be newcomers, services, technologies and facilities in an atmosphere of free competition,

letting the market place determine the survival of the fittest, subject to such minimum regulation as may presently be required in the execution of the Commission's statutory responsibility and to such future regulation as may become necessary or desirable in the public interest of legislation; or,

b) Permitting tests of different systems or services by different entities in various cities to afford some based on experience for decisions as to the best ultimate structure before any particular system or service becomes established on a widespread basis; or

c) Undertaking to devise a master plan now, before any new facilities and services are inaugurated, to guide their development?

ANSWER See Section VI, regulatory environment of this report.

QUESTION 3. Would the development, installation, and operation of a nationwide broad-band means for distribution to home and office of many varieties of information in different bandwidth "packages" from many local and/or remote sources benefit national objectives such as the strengthening of family and local community life, economic growth, improvement in productivity, and the growth of an informed public? If so, how?

ANSWER IED/EIA believes that the development of a nationwide broad-band network for the distribution of many varieties of information at different bandwidth packages from many local and/or remote sources will be of significant benefit to the meeting of national objectives. Availability of such a broad-band network would materially strengthen family and local community life, support economic growth, improve productivity, and contribute to the growth of an informed public. Our studies and others indicate that the lack of broad-band network may seriously impede the progress of the normal growth of business operations, education, and in the continuity of family life. These conclusions are based upon a reasonable projection of readily identifiable trends within the socio-economic environment which may create a significant impact by 1980.

A review of the projected socio-economic environment discussed in Section II leads to the conclusion that the need for a wideband communications facility will be urgent if we are to maintain social and economic progress. Containment of the growing incidence of crime and violence with limited physical resources may only be possible through the use of relatively sophisticated systems of electronic surveillance devices and information banks interconnected by a vital wideband data network. The problems arising from de-urbanization may be solved in part through new and advanced broad-band links interconnecting the developing suburban centers with the urban central core. The application of electronic aids and high-speed communications to the transfer of information (mail) will be an essential if community and business life are not to be seriously impaired by mail delays. Substitute systems for the transfer of information by electronic means over wideband data networks may provide the only acceptable solution. Soft fiscal transfer systems for business use are in early stages of development. The growth of these systems which will be vital to continued economic health can be seriously impaired if suitable wideband communications are not made available before 1980.

The concepts of "image transfer" and "pseudo-travel" may provide the best mechanisms for combatting future problems of travel congestion. These concepts may be dually effective in providing an effective substitute for inefficient and impractical trips in the anticipated future air, rail, and automobile traffic jams. By providing an acceptable alternative to business travel, the future congestion can be significantly relieved.

Community and family life problems of the future may not create or force critically urgent demands for wideband communications facilities, but the social and cultural gains that would result may be substantial. Expected work/recreation patterns will provide time for self-improvement. A wideband communications system can provide a sufficient number of video channels carrying educational or culturally oriented material. The effec-

tiveness of the self-improvement process can be substantially improved by the addition of a facility to permit interactivity and communication with the central facility. Computer aided instruction in the home becomes practical. Banking and shopping from the home may be more than a convenience; they may become economic and practical necessities as urban congestion develops. The availability of a terminal and the associated wideband network will lead to many additional benefits such as voting from the home, or remote interactive participation in community activities and political discussions.

QUESTION 4. Should we wait for natural evolution of such systems or should long range objectives and plans be developed by government and industry with provision for experimentation, development, and phase in steps?

ANSWER See Section VI, Paragraph B.

QUESTION 5. On what basis, do you believe, that our total economic/socio/political system is ready to support such an information distribution system vs. other systems now in use?

ANSWER The general broadcast and telephone service provided meets the expectations of the general public. However, the consumer has little concern over how the service is distributed as long as his cost structures and quality are comparable or improved. Spectrum availability for services unobtainable by cable distribution may ulitmately force usage of a non-radiating distribution system for broadcast service in the public interest.

Telegraph messages have declined by 50% since 1940. This is due to both the relative cost ($1.90/average message) and level of service decrease in price of phone service. The public will undoubtedly support a message service at an appropriate price level, somewhat above air mail service and considerably less than telegraph services. The public message (Telex and TWX) are limited predominantly to business due to their cost structure.

"The Report of the President's Commission on Postal Organization"

contains a detailed analysis of the current operations of the Post Office Department. It is clear from this report that manpower and volume considerations will result in continued service difficulty until technology and capital investment provide a practical alternative.

Travel congestion both in long distance air travel and ground transportation near urban centers is becoming an increasing problem. Continuation of this congestion will make travel in some areas unreasonable. These will be the most likely areas, which, in the short term, will foster an information distribution system. (e.g., also see Section VI, Economic Support for Service and Technology of this report.)

VIII. APPENDIX

From FCC Docket 18397

ITEM I (Paragraph 8 of FCC Docket No. 18397)

It has been suggested that the expanding multi-channel capacity of cable systems could be utilized to provide a variety of new communications services to homes and businesses within a community, in addition to services commonly offered such as time, weather, stock exchange ticker, etc. While we shall not attempt an all-inclusive listing, some of the predicted services include: facsimile reproduction of newspapers, magazines, documents, etc.; electronic mail delivery; merchandising, business concern links to branch offices, primary customers or suppliers; access to computers, e.g., man to computer communications in the nature of inquiry and response (credit checks, airlines reservations, branch banking, etc.) information retrieval (library and other reference material, etc.) and computer to computer communications; the furtherance of various government programs on a Federal, State, and municipal level, e.g., employment services and manpower utilization, special communications systems to reach particular neighborhoods or ethnic groups within a community, and for municipal surveillance of public areas for protection against crime, fire detection, control of air pollution and traffic; various educational and training programs, e.g., job and literacy training, pre-school programs in the nature of "Project Headstart," and to enable professional groups such as doctors to keep abreast of developments in their fields; and the

provision of a low cost outlet for political candidates, advertisers, amateur expression (e.g., community or university drama groups) and for other moderately funded organizations or persons desiring access to the community or particular segment of the community.

ITEM II (Paragraph 9 from FCC Docket No. 18397)

It has been suggested further that there might be interconnection of local systems and the terminal facilities of high capacity terrestrial and/or satellite inter-city systems, to proivde numerous communication services to the home, business, and educational or other center on a regional or national basis. The advent of CATV program origination in such cities as New York and Los Angeles (where there is also CATV activity) gives rise to the possibility of a CATV origination network or networks. The so-called "wired city" concept embraces the possibility that television broadcasting might eventually be converted in whole or in part, to cable transmission (coupled with the use of microwave or other inter-city relay facilities), thereby freeing some broadcast spectrum for other uses and making it technically feasible to have a greater number of national and regional television networks and local outlets.

ITEM III (Footnote 5, Paragraph 9 of FCC Docket No. 18397)

E.g., an increasing link between bulk data transmission and computers, and the special attribute of the satellite technology in the provision of service from one transmission point to many reception points, and in greater system flexibility as compared to fixed terrestrial facilities. As the satellite technology becomes more sophisticated, it might be utilized for multiple access data services and computer links, specialized switched networks, and random networks utilizing some mobile ground equipment for occasional service requirements.

ACRONUM DEFINITIONS

1. BCN - Broad-band communications network having a minimum of 300 MHz bandwidth and return facilities for receiving and/or tabulating specific requests and responses by individual users.
2. CATV - Community Antenna Television

3. CTV - Cable Television

4. BCNX - Intra-City Facsimile System

5. BCNL - Electronic Home Library Service

6. BCNH - Same information sent by facsimile to many receivers

Meetings re Telecommunications

Tuesday, April 8

11:00 a.m.	Ted Westfall, Exec. V.P., ITT Joseph Gancie, V.P., ITT World Communications John Ryan, Deputy Director, ITT Washington Relations

Wednesday, April 9

2:00 p.m.	Ed Crosland, V.P., Federal Relations, AT&T Ben Oliver, V.P., Government Operations, Washington
3:00 p.m.	Joseph A. Beirne, President, Communications Workers of America Louis Knecht, Assistant to the President John Morgan, Administrative Assistant
4:00 p.m.	Vincent Wasilewski, President, National Association of Broadcasters Grover Cobb, Chairman of the Board

Monday, April 14

11:30 a.m.	Howard Hawkins, President RCA Global Communications Leonard Tuft, V.P., Washington
3:30 p.m.	General James McCormack, Chairman, COMSAT Joseph Charyk, President
4:30 p.m.	Clifford Gorsuch, Regional Director National Association of Broadcast Employees & Technicians J. F. Donley, Regional V.P. of the Union (Nat. Bdcstg. Co.) Albert Recht, V.P. of local union (Am. Bdcstg. Co.)

Wednesday, April 16

2:00 p.m.	Al Hardy, Director of Radio, TV & Recording Div., International Brotherhood of Electrical Workers Lawrence Rimshaw, Bus. Mgr. for Local Union 1200

Friday, April 18

9:30 a.m. Earl Hilburn, V.P. and Spec. Asst. to the President, Western Union Telegraph Co.
Richard Callaghan, V.P., Congressional Liaison

Tuesday, April 22

11:30 a.m. Don Rodgers, Mgr., Missile and Space Field Operation, General Electric Company
Don Atkinson, Mgr., Aerospace Market Development

Wednesday, April 23

4:00 p.m. James Karayn, Washington Bureau Chief
National Educational Television

Friday, April 25

11:45 a.m. McGeorge Bundy, President
Ford Foundation

Tuesday, April 29

3:30 p.m. Robert King, IBM, Government Relations Consultant
Fred Warden, Communications Policy Directorate

Wednesday, April 30

10:00 a.m. Henry Catucci, V.P., Western Union International, Inc.
R. E. Conn, Senior Vice President, Law and Administration
Tom S. Greenish, Executive Vice President

Friday, May 2

11:00 a.m. Dr. A. D. Wheelon, Vice President, Engineering, Hughes Aircraft

Thursday, May 8

4:30 p.m. Richard Gifford, General Manager (Communications Products,Dept., General Electric Company, Lynchburg, V.

Tuesday, May 27

10:30 a.m. Fred W. Morris, Jr., President, Tele-Sciences Corp.

Wednesday, June 11

4:00 p.m. Frederick W. Ford, President
National Cable Television Association, Incorporated

Persons outside Government concerned with
Telecommunications Task Force Report

	Date of Meeting	Industry	
AT&T	4/9/69	Ed Crosland, V.P., Federal Relations, N. Y. 195 Broadway, NYC 10007	(212) 393-1000
		Ben Oliver, V.P., Government Operations, D.C.	(202) 466-4121
		Ben Givens, Asst. V.P., Federal Relations, D.C. 2055 L Street, N.W., D. C. 20036	
COMSAT	4/14/69	General James McCormack, Chairman Joseph Charyk, President David Acheson, General Counsel 950 L'Enfant Plaza, Washington, D. C. 20024	(202) 554-6020
General Electric	5/8/69	Richard Gifford, Gen. Mgr. Raymond Baker Mountain View Road, Lynchburg, Va. 24502	(703) VI 6-7311, x. 486
	4/22/69	Don R. Rodgers, Mgr., Missile & Space Field Operations Don Atkinson, Mgr. Aerospace Market Development 777 14th Street, N.W., Washington, D. C. 20005	(202) EX 3-3600
		Bernard White, Missile and Space Division King of Prussia, Pa. 19406	(215) 962-4111
General Telephone & Electronics		Theodore F. Brophy, V.P. and General Counsel Jim Clerkin, V. P. Operations 730 Third Avenue, NYC 10017	(212) 551-1000
		Gaylord Horton Suite 900, 1120 Connecticut Avenue, D.C. 20036	(202) FE 7-6600

Industry (Continued)

Hughes Aircraft	5/2/69	Dr. A.D. Wheelon, V.P. Engineering Bldg. 1, M.S. A193, Culver City, California 90230 Mr. Paul Visher, Associate Division Manager, Space Systems Division, Bldg. 366, M.S. A1260, P.O. Box 92919, Los Angeles, California. 90009 Mr. C. (Clell) H. McKinney, NASA & Commercial Communications Activities 1875 Connecticut Ave., Washington, D. C. 20009	(213) 391-0711, x 3770 (202) 234-9300
IBM	4/29/69	Robert King, Government Relations Consultant, D.C. George Hallgren, Federal Special Activities Representative Jack Melick, Data Processing Division, D. C. 1111 Connecticut Ave., Washington, D. C. 20036 Fred Warden, Communications Policy Directorate Old Orchard Road, Armonk, N.Y. 10504	(202) 333-6700, x 7391 x 7108 x 7035 (914) 765-1900, x 2241
IT&T	4/8/69	Ted Westfall, Executive V.P. 320 Park Avenue, N.Y., N.Y. 10022 Joseph Gancie, V.P., ITT World Communications John Ryan, Deputy Director, ITT World Communications 1707 L Street, N. W., Washington, D. C. 20036	(212) PL 2-6000 (202) 296-6200
RCA Global Communications	4/14/69	Howard Hawkins, President 30 Rockefeller Plaza, NYC 10020 Leonard Tuft, V.P. 1725 K Street, N.W., Washington, D. C. 20006	(212) 363-4200 (202) 337-8500
Sperry Rand Corporation		W. L. Barrow, V. P. for Research, Development & Engineering Herbert Harris, 1290 Avenue of the Americas between 51st and 52nd Streets, NYC 10019	(212) 956-2121

Industry (Continued)

Western Union International	4/30/69	E. A. Gallagher, President	(212) 363-6400
		R. E. Conn, Senior V.P., Law & Administration	
		Tom S. Greenish, Executive V.P.	
		26 Broadway, NYC 10004	
		Henry Catucci, V.P.	(202) 638-6724
		521 12th Street, N.W. Washington, D. C.	
Western Union Telegraph Co.	4/18/69	Earl Hilburn, Executive Vice President	(212) 577-4321
		60 Hudson Street, NYC 10013	
		Richard Callaghan, V.P., Congressional Liaison	(202) 628-8868
		Room 374, National Press, Bldg., Wash, D. C. 20004	

Industry Associations

American Advertising Federation of N. Y.		Howard H. Bell, President 1225 Connecticut Ave., Washington, D. C. 20036	(202) 659-1800
Association of Maximum Service Telecasters		Lester Lindow, Executive Director 1735 DeSales St., N.W., Washington, D. C.	(202) 347-5412
Electronic Industries Association		George Butler, President, 2001 I Street, N.W., Washington, D. C. 20006	(202) 659-2200
National Association of Broadcasters	4/9/69	Vincent Wasilewski, President Grover Cobb, Chairman of the Board 1771 N Street, N. W., Washington, D. C.	(202) 293-3516
National Cable Television Assoc., Inc.	6/11/69	Frederick W. Ford, President 1634 I Street, N.W., Washington, D.C. 20006	(202) 347-3440
National Educational Television	4/23/69	James Karayn, Washington Bureau Chief 1619 Massachusetts Ave, N.W., Washington, D.C. 20036	(202) 483-6367
Radio Advertising Bureau		Miles David, President 116 E. 55th St., NYC	(212) MU 8-4020
Television Bureau of Advertising, Inc.		Norman Cash, President 1 Rockefeller Plaza, NYC	(212) PL 7-9420
United Utilities, Inc.		Paul Hinson, President 1700 K St., N.W., Washington, D. C.	(202) 659-4600
United States Independent Telephone Companies Association		Clyde Sautters, Govt. Communications Coordinator Adm. William C. Mott, Executive Vice President 425 Pennsylvania Avenue, N. W. Washington, D. C.	(202) 783-5300

Institutions

Brookings Institution		William Capron 1775 Massachusetts Ave, N.W., Washington, D. C.	(202) HU 3-8919
Carnegie Corporation of New York		Alan Pifer 437 Madison Avenue, NYC	(212) 753-3100
Ford Foundation	4/25/69	McGeorge Bundy, President Paul Laskin, Task Force Contact 320 East 43rd St., NYC 10017	(212) 573-5000

Labor

American Federation of Television & Radio Artists		Vicki Viola, NYC 724 5th Ave, NYC	(212) CO 5-3267
Communications Workers of America	4/9/69	Joseph A. Beirne, President Louis Knecht, Assistant to the President John Morgan, Administrative Assistant 1925 K Street, N.W., Washington, D. C. 20006	(202) FE 7-7711
International Brotherhood of Electrical Workers	4/16/69	Al Hardy, Director of Radio, TV & Recording Division Lawrence Rimshaw, Business Manager for Local Union 1200 1200 15th St., N.W., Washington, D.C. 20005	(202) CO 5-8040
National Association of Broadcast Employees & Technicians (Chicago)	4/14/69	Clifford Gorsuch, Regional Director J. F. Donley, Regional V.P. of the Union (NBC) 4530 Connecticut Ave., Washington, D. C. 20008 Albert Recht, Vice President of local union (same address) James Harvey, ABC, International V.P. (same address) Timothy J. O'Sullivan, President, Hollywood, Calif. 606, North Larchmont, Los Angeles, Calif.	(202) 244-7527 (213) 464-9138

Technical Groups

Joint Technical Advisory Committee of Electrical & Electronic Engineers & the Electronics Industry Association		John M. Kenn, Secretary 345 E. 47th St., NYC	(212) PL 2-6800
Tele-Sciences Corporation	5/27/69	Fred W. Morris, President 9315 Holly Oak Court, Washington, D. C. 20034	(202) 469-6034

8/6/69

Tom asked me to set up a file on things we hear from people on domestic satellites -- outside of Government.

Someone will have to handle them -- maybe Gessaman.

August 19, 1969

Dear Fred:

Thank you for your kind letter of July 30th regarding our action on the domestic communications satellite issue. I have indeed met Walt Hinchman, and am finding him and his analyses very useful. I will indeed be in touch if our efforts involve any outside assistance.

Sincerely,

Clay T. Whitehead
Staff Assistant

Mr. Fred W. Morris, Jr.
President
Tele-Sciences Corporation
9315 Holly Oak Court
Washington, D. C. 20034

cc: Mr. Whitehead
Central Files

CTWhitehead:ed

Tops

TELE-SCIENCES CORPORATION
TELECOMMUNICATIONS CONSULTANTS

9315 HOLLY OAK COURT
WASHINGTON, D. C. 20034
TELEPHONE (301) 469-6034

July 30, 1969

Dear Tom:

Congratulations on the positive step forward you are taking and the leadership exhibited in your convening a study group to consider the domestic communications satellite issue and to advise the FCC concerning the Administration's policy position. I want to join many others in wishing you well in your endeavor. In my opinion it is unfortunate that such leadership has not been forthcoming from the ODTM in the past.

During the Johnson/Rostow Task Force on Communications Policy, Mr. Walter Hinchman - now with the Department of Commerce, Boulder, Colorado - contributed some fine analysis in the field of your new effort. If you have not already made contact with Walt, I suggest you do so.

Please let me know if I can be of any assistance to you or your associates.

With personal regards,

Sincerely,

Fred

Fred W. Morris, Jr.
President

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

THE WHITE HOUSE

WASHINGTON

August 19, 1969

Dear Mr. _____:

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

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

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

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

Sincerely yours,

Clay T. Whitehead
Staff Assistant

Enclosure