1. SMALL BUSINESS

Problem: Operators of small businesses are being deprived of access to essential radio communications with vehicles, e.g., plumbing contractors, ready-mix cement truckers, florists, electrified service contractors, road service and towing companies.

OTP Potential: Working with the FCC, new land mobile communication policies can be developed that would assure not only additional frequency spectrum resources for small businesses but also implementation of new mobile communication concepts of greatly enhanced capacity.

2. PUBLIC SAFETY

Problem: Effective police, firefighting, and emergency service operations are being impaired due to inadequate communications.

OTP Potential: Under OTP initiative -- working with the FCC, Department of Justice and the Office of Emergency Preparedness -- additional spectrum, adoption of modern communications concepts and implementation of area wide improved public safety communications systems can be realized.

3. SMALL TOWN/RURAL AMERICA

Problem: How can small town rural residents obtain the benefits of modern telecommunications?

OTP Potential: With increased stimulus, there are many foreseen expanded applications of telecommunications for the benefit of small town and rural America. For example, the Missouri "green phone" network provides expeditious information to farmers; the Kentucky Hospital Emergency Radio Network links rural hospitals, doctors, and home health service nurses; the Mississippi "Coordinated Accident and Rescue Endeavor" links hospitals, rescue helicopters and ambulances; and land mobile and telemetering communications can increase reliability of rural electric and telephone lines.

4. POLLUTION AND ENVIRONMENT

Problem: Given a more forward looking policy framework, telecommunication techniques could be brought to bear to cope with pollution and environmental problems.

OTP Potential: Telemetering techniques, river gauging devices, ocean data buoys are capabilities already available to help control pollution and to warn of environmental changes. With adequate spectrum provisions and communications networks, increased sensing can be effected and vital information disseminated in adequate time for protective actions to be taken.

5. EDUCATION

Problem: All levels of education, from vocational schools to universities, can benefit from readily available communications-electronics technology but lack of adequate policy direction has prevented such capabilities from being used extensively.

OTP Potential: Review of spectrum resources, prospective policy guidance and development of innovative concepts for distribution and use of educational and public service information could be undertaken if adequate resources were available.

6. URBAN RENEWAL AND MODEL CITIES

Problem: Telecommunication services should be integral to urban renewal and model city planning and development but are often either overlooked or only superficially considered due to the absence of forward looking policy planning.

OTP Potential: If resources were available, OTP could move forward with sorely needed policy and planning development in such areas as "Wired City" concepts, transportation control and greatly expanded land mobile resources.

7. INCREASED AIR TRAFFIC CONGESTION

Problem: While communications-electronics techniques offer great potential, inadequate facilities exist for coping with steadily increasing aircraft operations already causing congestion in major metropolitan areas.

OTP Potential: With limited resources currently available, some improvements are being made. However, much more can and should be done to stimulate the development of better collision avoidance, air traffic control, and air-ground communications systems. Spectrum allocations and associated propagation/electromagnetic compatibility problems need in depth analysis which only can be undertaken with an expansion of existing capabilities.

Friday 1/29/71

EVA

12:15 Mr. Whitehead said after Mr. Dean gives him an idea what kind of problems TVA is having (per their discussion), then he will discuss writing a letter.

2/10/71

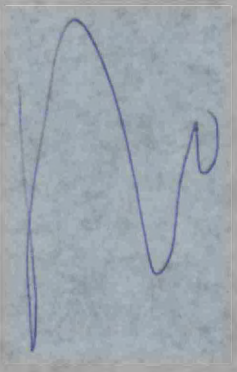
January 21, 1971

To: Mr. Dean
From: Eva

Mr. Whitehead has learned that Red Wagner of TVA plans to come to Washington on February 10th. He wants to drop him a note and invite him to come in while he's here in town.

Tom would like you to prepare a very informal briefing re the accomplishments, etc. of TVA so he can be a little more exact in his letter to Wagner.

Said to tell you that the real purpose is to discuss Joe Evins.



2/7

Thursday 1/28/71

7:00 Do you need to write the note to Red Wagner about the possibility of his coming by when he's in Washington on February 10th?

Is Steve doing anything about the possible stopover at TVA on your return from Houston speech (2/17)?

(Judy has the papers from Will Dean re the JoEvins material)

Pending

Thursday 2/11/71

3:50 Called Rose Ann Herold in Mr. Hopkins' office and asked if she could tell me anything about the submission of the Annual Report of the Corporation for Public Broadcasting.

She said it had indeed been submitted very recently by the President to the Congress (the 1969) report)) and they are holding the 1970 report for later submission.

She has promised to send a copy of the 1969 submission and will keep in mind to send us a copy when the 1970 report is submitted.

Called Miss Nicosia in Bill Duke's office to advise.

She would appreciate hearing when we get the word about the 1970 report going up.

Tuesday 2/9/71

3:10 Eileen Nicosia (Legis. Asst. to Bill Duke), Corporation for Public Broadcasting, called to say they understood that the 1969 annual report that should have gone from the President to Congress last year had just been put in a couple of days ago by the President.

They now have submitted their 1970 annual report and they are wondering what is going to happen to it.

Tom suggested checking with Mr. Scalia and find out whether the Act requires that the report should go through the President or whether it is sufficient that the Corporation send copies simultaneously.

Tom suggested that we call Campbell's office and find out if he wants us to take the responsibility on this.

We find that the Hill got copies but not officially from the President, as per requirements -- a group was sent to Hopkins.

(Ann Broomell was the person who discussed this with Judy)

Pending

January 21, 1971

To: Mr. Dean
From: Eva

Mr. Whitehead has learned that Red Wagner of TVA plans to come to Washington on February 10th. He wants to drop him a note and invite him to come in while he's here in town.

Tom would like you to prepare a very informal briefing re the accomplishments, etc. of TVA so he can be a little more exact in his letter to Wagner.

Said to tell you that the real purpose is to discuss Joe Evins.

5. TENNESSEE VALLEY ADMINISTRATION (TVA)

The TVA currently uses radio in diverse ways to support its operations. The primary use is for the operation and maintenance of the TVA electric power system, which supplies electricity throughout Tennessee and neighboring states.

Additional services provided by communications-electronics are electric power command (pooling electrical resources throughout the country); close coordination with non-Government electrical power sources; development and maintenance of hydrological capabilities, particularly in the area of water quality; safety in the TVA area for large segments of the public engaged in recreational activities; construction and expansion of the TVA system (particularly important in view of the possible adverse effects of high power induction), and the recently emphasized need for protection of the environment. A representative example of TVA's need for radio frequencies is in the attached letter which outlines a requirement for high frequencies to permit TVA to participate in field trials of the electric power-pool command control radio network. The frequency resources required have been provided.

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

FILES

September 16, 1970

Mr. S. L. Windes, Chief
Telecommunications Staff Office
United States Department of the Interior
Office of the Secretary
Washington, D. C. 20240

Dear Mr. Windes:

Thank you for your letter dated August 31, 1970, concerning field trials of the electric power-pool command control radio network.

We have planned that TVA participate in these field trials and of course have been awaiting specific frequency assignments to be cleared before applying to you for authorization to proceed. As you know, we operate as a member of the Southeast Region of NAPSIC and our proposed participation would be in cooperation with this organization. A meeting of the Southeast Region of NAPSIC Communication Subcommittee is scheduled for early October, and I would like to wait until after this meeting to contact you further regarding our wishes in this matter. It would appear that we will be hampered considerably in the Tennessee area until the additional frequencies for daytime use are cleared. In any case, we will contact you in the usual way regarding applications for these field trials.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

T M Swingle

T. M. Swingle, Chief
Communication Engineering and Design Branch

NAPSIC = North American Power System Interconnection Committee.

SEP 22 RECD

Tom wants a file
on

Communications in Society for
Joe Evins' benefit

Ask him week of 2/1 whether
he wants to do anything.

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

Date: December 17, 1970

Subject: Outline of an article to be of interest to Congressman Evins

To: Mr. Clay T. Whitehead

Attached is an outline of thoughts entitled "Toward an Understanding of the Need for Comprehensive Communications Planning." This topic purposefully goes beyond the "importance of telecommunications to the country" and attempts to show current needs, the potential technology waiting in the wings, and the critical importance of comprehensive planning to promote and protect the public interest. Subtly written, I think we can gain the reader's interest not only in the problems and potential solutions, but also in our role in the policy planning process.

Michael

Michael J. McCrudden

Attachment

Neal. Look it over well, but let him run the lead with specifics & the hell with philosophy.

DRAFT
December 16, 1970

TOWARD AN UNDERSTANDING OF THE NEED FOR COMPREHENSIVE COMMUNICATIONS PLANNING

I. THE PRESENT NEED

1. New and Improved Methods for the Communication of Ideas and the Transmission of Data Hold the Potential for Substantial Benefits to Society.

   . The production of data and information, the creation of ideas, and commentary on current tasks and problems are each at an all time high. Specifically
   - the "knowledge explosion"
   - increase in data communication
   - intensive social commentary.

   . The distribution systems presently available cannot handle the potential needs for the inter person transfer of knowledge, ideas, and data.

   . To the extent that communication systems for the distribution and interchange of ideas are developed, the material presently available can be more nearly matched to the present and anticipated needs.

2. Several Areas Would Appear to Benefit Substantially from New and Improved Applications of Communication Technology. The Most Prominent Areas Include

   . Education

- basic
- remedial
- vocational/trade schooling
- correspondence
- undergraduate and graduate

Commerce and business

- banking and financial
- business services to small business at lower costs. (i.e. inventory control, reordering)
- data exchange and transmission.
- more efficient distribution of buying information.
- more accurate analysis of business conditions, trends, etc.

Law enforcement and crime prevention

- criminal record and identification systems.
- improved judicial management and streamlining of judicial proceedings
- crime detection systems
- surveillance systems.
- legal (case, decision) information retrieval systems.

Community renewal (urban and rural)

- streamlining of local government.
- increased citizen awareness and participation of community activities.

- increased communication between communities.

. Defense

- more effective response to problems.
- more efficient management of responses.
- higher reliability of command execution.

. Management and Operation of Government (at all levels, national, state, local)

- increased coordination within governments and between governments.
- more efficient management of resources.
- more effective involvement of citizens.
  (1) knowledge of government affairs.
  (2) new methods of citizen participation.

3. Anticipated Results May Be of Greatest Value to Groups/Communities Previously Isolated Either Socially, Physically, or Economically.

. Rural areas

. Isolated small and medium size towns and cities.

. Urban core areas and neighborhoods.

. Minority groups separated by cultural or racial barriers.

. Ethnic groups separated by language barriers.

II. SOME POTENTIAL SOLUTIONS

1. Specific Technical Applications Will Vary According to

- User requirements
- Cost alternatives
- Requirement for systems integration

2. Technologies Presently Available for Introducing New and Improved Communications Facilities Include
   - Satellite systems
   - Microwave systems
   - Cable systems
   - Video recording/playback systems
   - A variety of terminal devices designed for a large number of specific uses
   - Combinations of the above

3. Specific Applications of Available (Or Soon-to-be-Available Technology) and Identified Problem Areas Have Been Developed

   (Note: The bulk of the paper could be developed here, by discussing specific system applications to specific problem areas. The number of examples which can be developed is substantial given the combinations which are available if we interrelate the several sets of factors sketched out above.)

III. THE ROLE OF COMPREHENSIVE PLANNING

1. Resources are Limited and In Many Instances Costly.
2. Potential Benefits are Great; But Misuse of Powerful Technologies Poses Substantial Hazards.

3. The Public Interest Will Be Increasingly Affected by the Application of New and Improved Communication Technologies in Areas of Public Concern (As Outlined Above).

4. Comprehensive Public Policy Planning for Communications Is Necessary to Insure Efficient Use of Resources and the Protection of the Public Welfare As We Plan for and Implement the Developing Technologies.

National Governors Council on Science and Technology
Statler Hilton Hotel
Washington, D. C.

Presentation by Dr. Peter C. Goldmark
President and Director of Research
CBS Laboratories
Stamford, Connecticut

December 14, 1970

Within the incredibly short span of a century we have learned to communicate over wires, we have learned to communicate without wires, we have learned to communicate on film, on records, on magnetic tape; we have also learned to communicate under water and in space. But we have not yet learned how to communicate from man to man.

A paradox of communications is that the farther people are from each other, the more complex and difficult it is for them to communicate because of technology requirements. However, the reverse is true too, namely the closer and tighter people live, the harder it is for them to communicate. People become angry.

There are innumerable studies under way in the Government, in industry, in scientific societies, all examining individual segments of communications technology and their future role and impact. This strikes me like guppies rushing about in a fish bowl, outwardly their energies cancelled, although their individual efforts, totalled non-vectorially, may be sizable. We can no longer afford this approach. We are facing an urgent and giant problem: The question of survival within and outside of our cities, which means that we must apply our national resources in a coordinated fashion on an overall systems basis, the same as when we were headed for the moon.

This is the greatest technological challenge in this country's history and communications technology is the key element. The solutions will require innovations since the inventions have already been made. Before we examine where we are and where we are headed, let us look back and see from where we came.

Ten thousand years ago, in the entire world there were no more people than in Greater New York City today, about 10 million. Figure 1 shows how population increased in the last few hundred years. By the year 2000, the earth population will be six billion and, at the same rate of growth, in a hundred years it will be 24 billion. 1

In Figure 2, we see that life expectancy only two centuries ago, was around 30 years (this included child birth mortality), but it is almost two and a half times that today. 2

Figure 3, the third graph, illustrates the frightening growth of explosive power we have created. Figure 4, indicates that from earliest history until 150 years ago, man traveled on earth no faster than 25 miles per hour, namely on horseback. Today this figure is 25,000 miles per hour -- in space. 3 4

Now let us look at a most interesting and important graph: The cumulative number of books (titles) which have been published since the invention of the printing press (Figure 5). In the last 200 years, this number climbed from barely one million to 50 million today. There is a cause and effect relationship: The most significant step in communications, namely printing, made it possible for scientists to learn about the ideas and discoveries of others rather than to explore needlessly ground already covered. The result is that science and technology has developed at a tremendously accelerated rate, as shown in Figure 6. 5 6

The rapidly increasing earth population to a large degree is due to the sciences of medicine, nutrition, and hygiene. For reasons not wholly understood and also because of certain technologies and lack of others, a majority of people in most western countries, particularly in America, live under conditions of extreme density and within the confines of cities and their suburbs. Man is physiologically and psychologically unprepared for the resultant stresses and strains.

Three quarters of the United States population lives on less than ten percent of our land and, in certain areas, conditions are even more appalling. The north-eastern seaboard of the U.S., which could be called the world's largest urban center, now contains one-quarter of the U.S. population (50 million), but occupies only one percent of this country's land area.

Assuming current trends continue and the U.S. population growth between now and the year 2000 is 100 million, then the U.S. will look like a map in Figure 7. Here 70% of the total U.S. population, or over 200 million peope, will live in the twelve urban centers shown, on only 10% of our total land area. Over 50% of the total U.S. population, or some 150 million, will be in the three largest urban concentrations, namely:

Boston - Washington
Chicago - Pittsburgh
San Francisco - San Diego

Clearly, the human species faces in his cities today problems with which he is no longer able to cope. I am talking about crime, pollution, poverty, traffic, education, etc. It is true, these also exist in the small cities, but they are manageable and will remain so, if proper planning limits the size of these towns.

It seems appropriate that science and technology, having created unwittingly some of the crises, should also help to rectify them. We must provide the generations following us with a greatly improved quality of life. This will only come about if the majority of the people will live and work on the major portion of our land. The task is gigantic, but we must accomplish it, and communications technology is the key.

THE PLAN

People usually migrate to places which offer good employment opportunities and good living environment. Business and industry also seek areas where suitable work force is available. Thus, two things must happen:

First, state and nationwide planning must get under way to pinpoint small cities according to the availability of space, people, utilities, and other local conditions, desirable for specific businesses and industries. The degree to which small communities have the desire to grow in this manner, has to be taken into account. Based on

information so far available, well planned expansion with a definite ceiling is frequently welcomed, particularly, if the benefits are clearly spelled out and visible ahead of time.

The second important requirement is that business and industry find it attractive to operate in this new environment, permitting them to function at least as well and preferably better than in the current concentrated urban locations. There will be direct and indirect benefits to the companies; the improved working and living conditions in unpolluted rural surroundings, lower living and real estate costs, negligible crime, traffic, and social problems. A happier and better working force should be equally advantageous to employees and employers.

As an example; a company or a government department instead of housing 20,000 people in a single metropolitan sky-scraper would distribute its operation over 20 locations, each with 1,000 employees and the units separated by hundreds of miles or more. On the other hand the plan must also work for relatively small companies with total employees of 500 to 1,000.

Before all this can happen, one has to prove to business and government that it can perform its various functions well or better in the new rural locations. This is where communications technology comes in.

Essentially we are talking about creating new and larger communities using existing ones as nuclei. For this nationwide plan to function and fulfill its prime objective, we must stress the need for these enlarged towns to plan at the outset the amount of business, the optimum size of population, the amount of traffic on the surface and in the air and for all other factors which the fully grown new community will be able to handle.

We have to be concerned not only with communication in business but with creating for the people living in these communities a more meaningful life through the use of communications technology. We must realize thet these people will have to rely more on communications facilities for culture, entertainment, education etc. Through the same broadband communication system which interconnects business and which will electronically carry the mail, we will supply high-quality programming for education, culture and entertainment. At the same time we must improve the technical quality of these services. For instance, today's television screen in the home may be large in terms of what technology could do when current television standards were set a quarter century ago. In the homes of the new communities, there should be television screens measured in feet rather than inches and containing ample picture clarity and brightness. Thus broadband cables will be able to bring

to the large screens a variety of services using improved television standards. The large screen will now become the center of many activities in the home, through broadband cables, through broadband signals, and through pre-recorded video cassettes. Suddenly, the world of responsive education will be available to the home as well. Home correspondent courses, all types of instructional and information programs, travel, language, and art instruction, etc. through video cassettes will not only be easy but exciting. Entertainment and cultural programs from major urban centers in the country and from abroad will have to be made available.

College education in another matter that needs to be examined as an important part of these plans. If during the next decades many communities across the country grow into components of a new living pattern, it would be preferable if those who wish could attend local college. There would be a series of satellite campuses to avoid further populating the already over-crowded large universities. A typical satellite campus as proposed here could serve a number of small communities. It would have comprehensive communication links with the nearest large university. A very capable, small local faculty would be essential and full interplay between the large university center and the satellite campuses would have to be developed.

Two-way broadband cable systems could provide interaction through large screen television classes, sharing of computer and library resources at the same time reducing travel between the university center and the satellite campuses.

Regarding pollution: Several regional planning councils are caught up in a very dangerous planning exercise. One deals with the development of a comprehensive Atlantic community stretching from Boston to Washington as one large living center and this is planned for the year 2000. But today, approaching the Eastern coast of the United States by airplane, from hundreds of miles one often sees a solid blanket of polluted air. Pollution, unfortunately does not observe boundaries and with almost one quarter of the United States population today occupying this tiny strip of land -- 1% of the country -- the gases and other pollutants heading skyward at times fuse into a coherent ceiling of smog. We must plan for spreading ourselves over far greater areas than we ever believed would be necessary, in order to be able to dissipate airborne, surface and fluid wastes generated by our growing population.

A special committee of the Connecticut Research Commission (CRC) and of the National Academy of Engineering have joined forces to study how the proper application of communications technology could affect the future living patterns in Connecticut and in the nation.

Connecticut is developing planning strategies to accommodate a rapidly growing population. In doing so, the state must preserve

its attractive -- essentially rural -- living environment without channeling the population increases into its already over-crowded cities.

Connecticut is also experiencing another change process which reflects a national trend -- the type of work upon which its economy is based. The number of persons presently employed by service industries in Connecticut is nearly twice the total of those employed in manufacturing. This is expected to increase to three times by the year 2000. Thirty corporate executive offices have moved from New York to Connecticut in the first six months of 1970 and eight more are planning to move but nearly all of these are located in the already populous southwest corridor. Figure 8 shows what the state may look like with and without planning efforts.

Our study proposed the adoption of a Multiple Urban Centers plan. This concept would channel new population growth into a large number of urban centers. These are assumed to be expansions of present communities (an assumption consistent with England's successful experience in creating "new towns" of limited size around smaller existing communities). The "Multiple Urban Centers" Projection, allows the greatest number of Connecticut's future population to live in small cities in rural settings.

The proper application of communications technology can help make it a reality. NAE-CRC studies are under way in

Connecticut to lay the basis for State action. These studies would be of interest to any state becoming involved in this project. The following are the tasks some of which are completed:

1. Investigate communications techniques and needs as they presently exist in business and in industry.
2. Investigate reasons for industry's preference (past and present) for new locations.
3. Identify communities in Connecticut with growth potential.
4. Identify areas where new communities might be built.
5. Identify existing highways and proposed highways.
6. Investigate the feasibility of electronic communications highways.

Interviews were conducted with Connecticut government departments and several businesses to ascertain their views of the role of communications technology in the future planning of Connecticut.

Our committee discussed with the Connecticut Department of Transportation the possibility of running conduits for broadband cables under existing and new highways as a means of interconnecting new sites for living and working.

The Connecticut Department of Transportation was very receptive toward a broadband communications network (BCN) carried under the highways. They noted that several highways already host many cables and mains.

Another phase of our study for decentralization concerned the status of CATV in Connecticut. Initial contacts with the State Public Utilities Commission showed that CATV systems are increasingly recognized as potential "BCN" users and could provide broadband channels for educational, municipal, and business purposes. CATV or maybe better called cable television has an important bearing on this plan and further study will be necessary.

Naturally, people and companies don't like to move, unless they have to. In this plan we are really considering the new population and minimizing the resettling of existing people. Nevertheless, we had to find out about people's likes and dislikes of various environments.

The Connecticut Office of State Planning produced information which helped answer our questions concerning population attitudes.

Regional profiles were derived from Connecticut residents' attitudes towards their towns and the State. The respondents were grouped by region so that regional variations could be determined for the following questions:

1. Reason for selecting town
2. Most-liked and disliked town feature
3. Major town problem
4. Major State problem

The overall detailed study gave great deal of useful information which will be analyzed.

Based on the results of the study thus far, CRC and NAE will continue to investigate with maximum dispatch the feasibility of distribution of business and industry to rural areas. Specific actions will be:

1. Study the feasibility of a demonstration project centered around an existing industry in an unpopulated section of Connecticut.
2. Determine the feasibility of another pilot project in the north-eastern sector of Connecticut, centered areound the University of Connecticut, Storrs.
3. Determine the type of broadband communications system its users, services, and costs necessary to attract business and people to the Storrs area.
4. Invite Federal and State Government and industry to joint CRC and NAE in carrying out specific demonstrations using existing broadband links and terminal equipment to ascertain the practicability of the plans discussed here, and to stimulate these groups to plan for future needs.

Work is underway on all of the aforementioned tasks; but of particular interest today is the nature of federal and state government involvement.

Both the Postal Service and the Department of Housing and Urban Development are actively supporting the project and have appointed their representatives to the joint committee.

On the national level, the NAE-CRC feels that a number of states should be brought together to initiate both intrastate and interstate planning. Preferably these states will represent the geographic, economic and demographic characteristics of the nation. It is important to realize that the less densely populated states have as an important role to play as the densely populated states in creating new national settlement patterns. The NAE-CRC welcomed recently the participation of the Georgia Science and Technology Commission.

All this is a glimpse of the work going on in an area where communications technology plays an important part, but where the human and governmental factors together with transportation needs and economic changes demand a complex and thorough systems study. We herewith invite other states to join us.

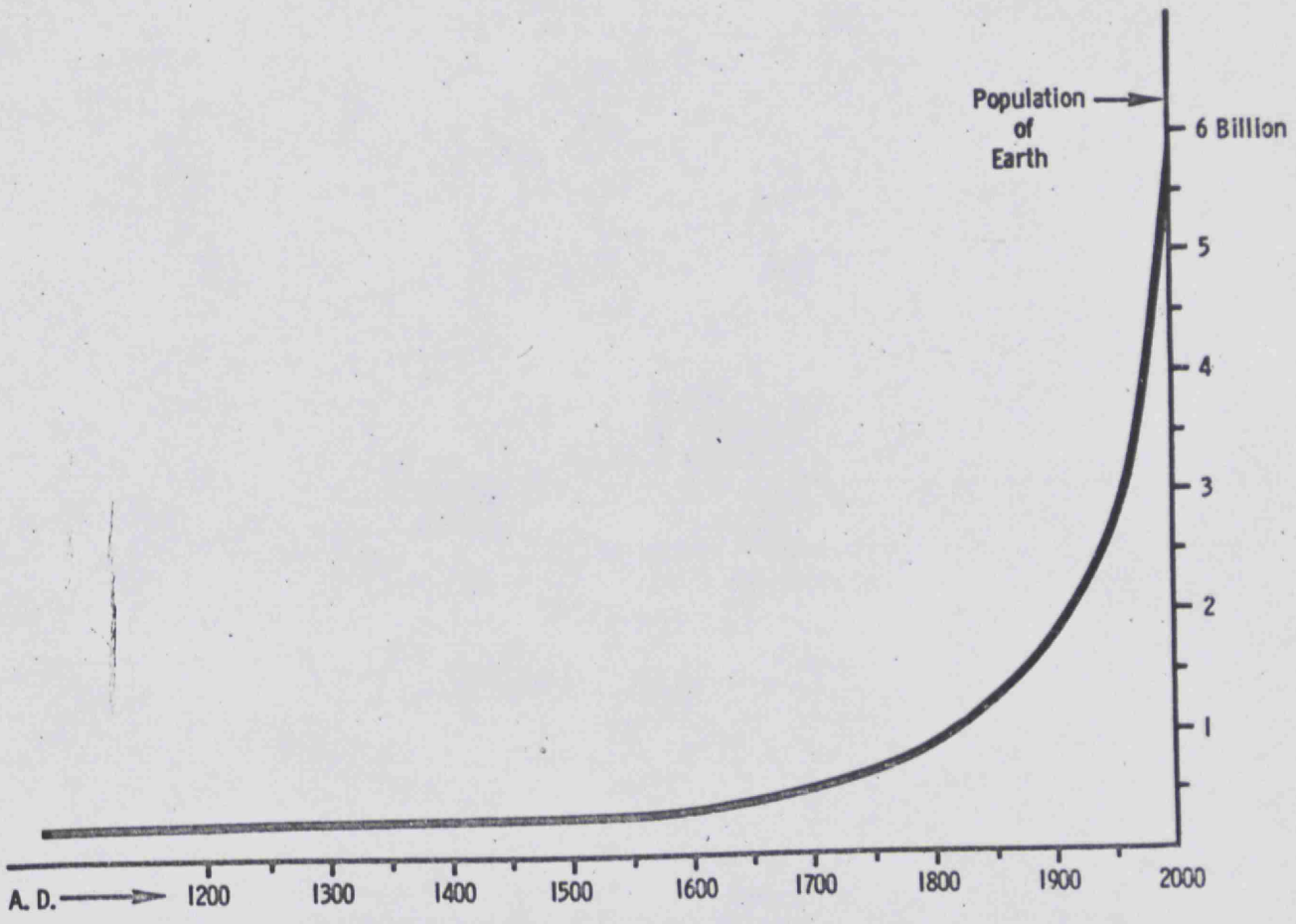
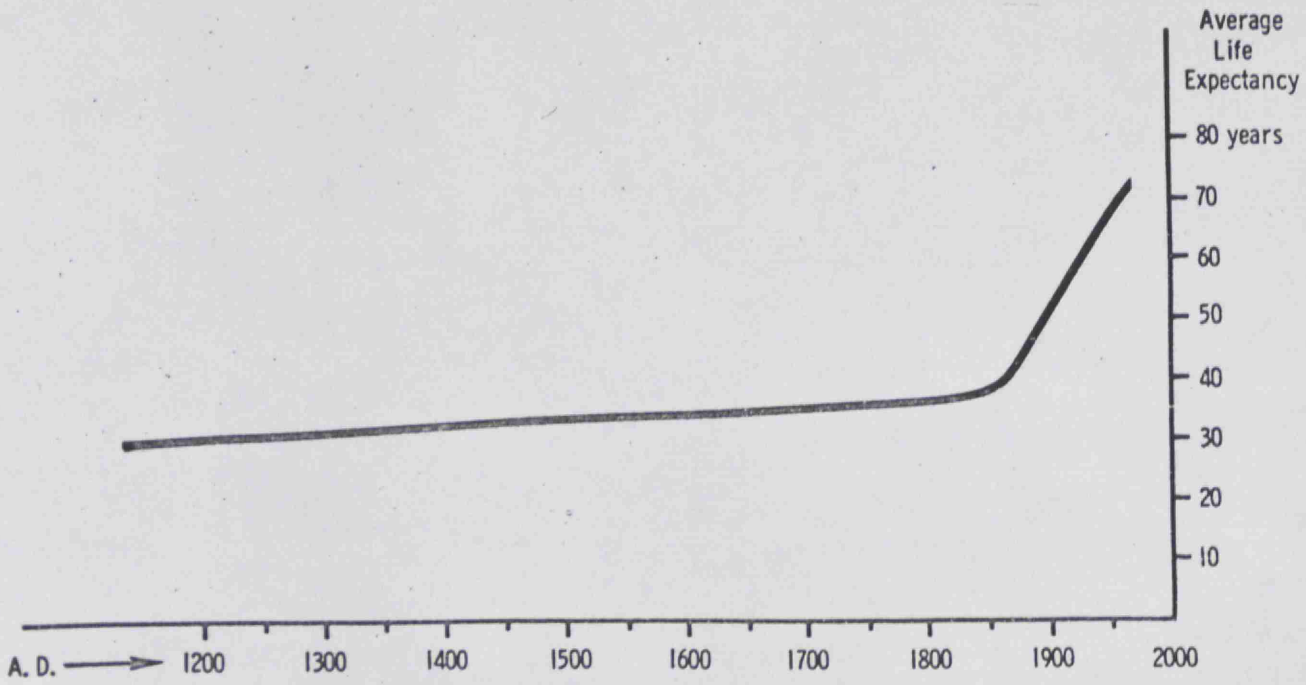

Population
of
Earth
6 Billion
5
4
3
2
1
A. D.
1200
1300
1400
1500
1600
1700
1800
1900
2000

Figure 1


Average
Life
Expectancy
80 years
70
60
50
40
30
20
10
A. D.
1200
1300
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1600
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1900
2000

Figure 2

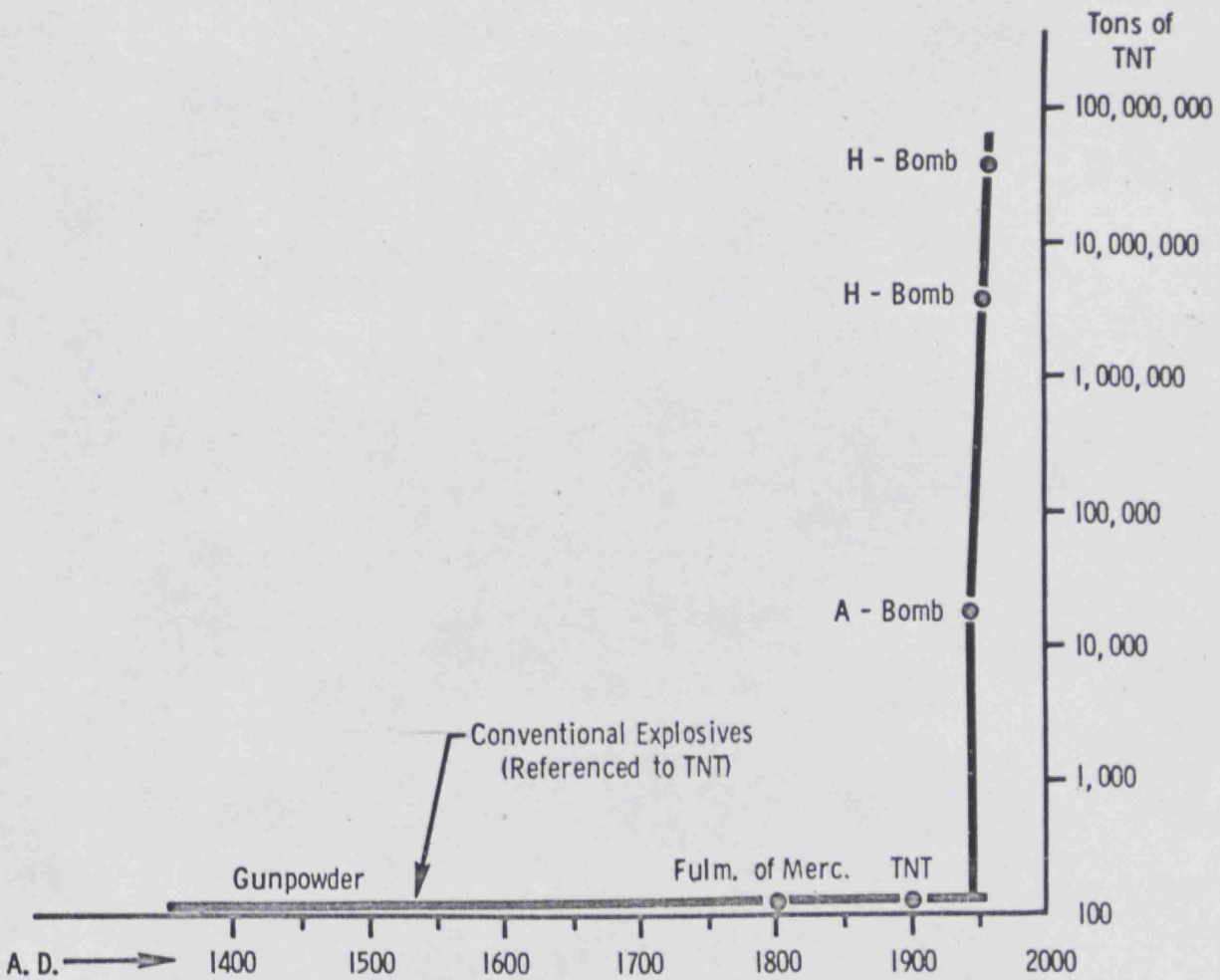

Tons of TNT
100, 000, 000
10, 000, 000
1, 000, 000
100, 000
10, 000
1, 000
100
H - Bomb
H - Bomb
A - Bomb
Conventional Explosives
(Referenced to TNT)
Gunpowder
Fulm. of Merc.
TNT
A. D.
1400
1500
1600
1700
1800
1900
2000

Figure 3

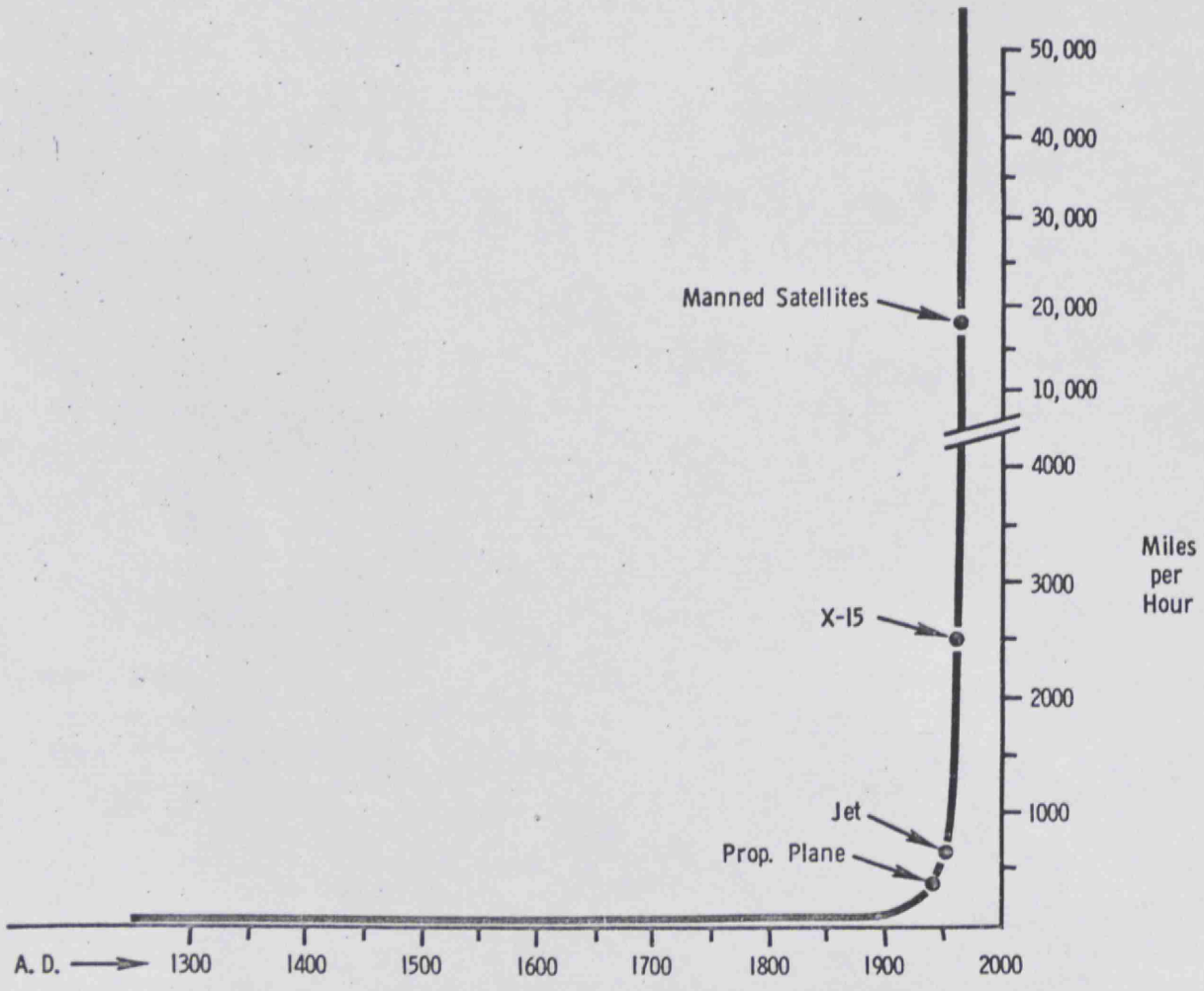

50,000
40,000
30,000
20,000
10,000
4000
3000
2000
1000
Miles per Hour
Manned Satellites
X-15
Jet
Prop. Plane
A. D.
1300
1400
1500
1600
1700
1800
1900
2000

Figure 4

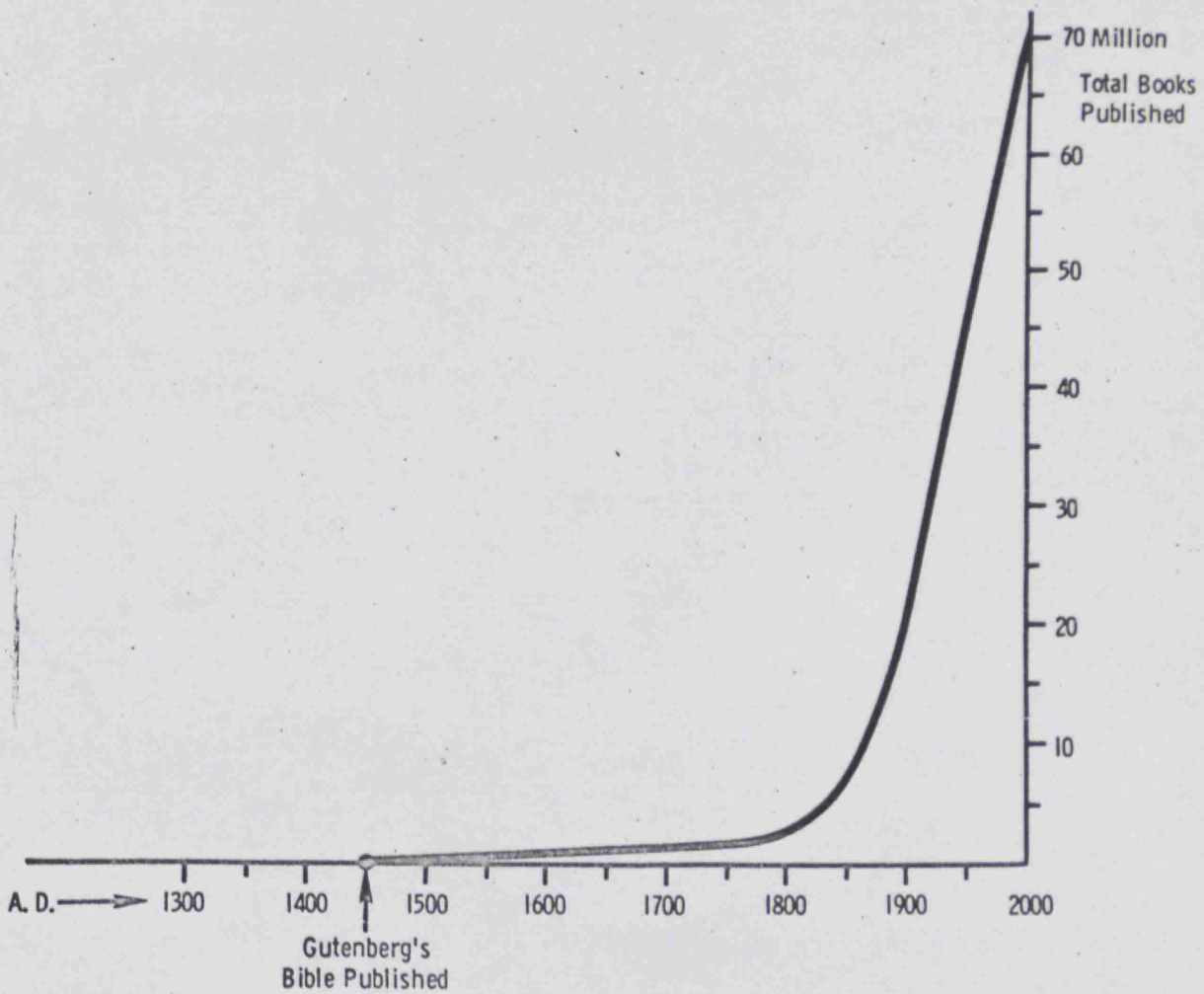

70 Million
Total Books
Published
60
50
40
30
20
10
A. D.
1300
1400
1500
1600
1700
1800
1900
2000
Gutenberg's
Bible Published

Figure 5

SELECTIVE ILLUSTRATIONS OF THE SPEED FOR INTRODUCING TECHNICAL DEVELOPMENT INTO SOCIAL USE

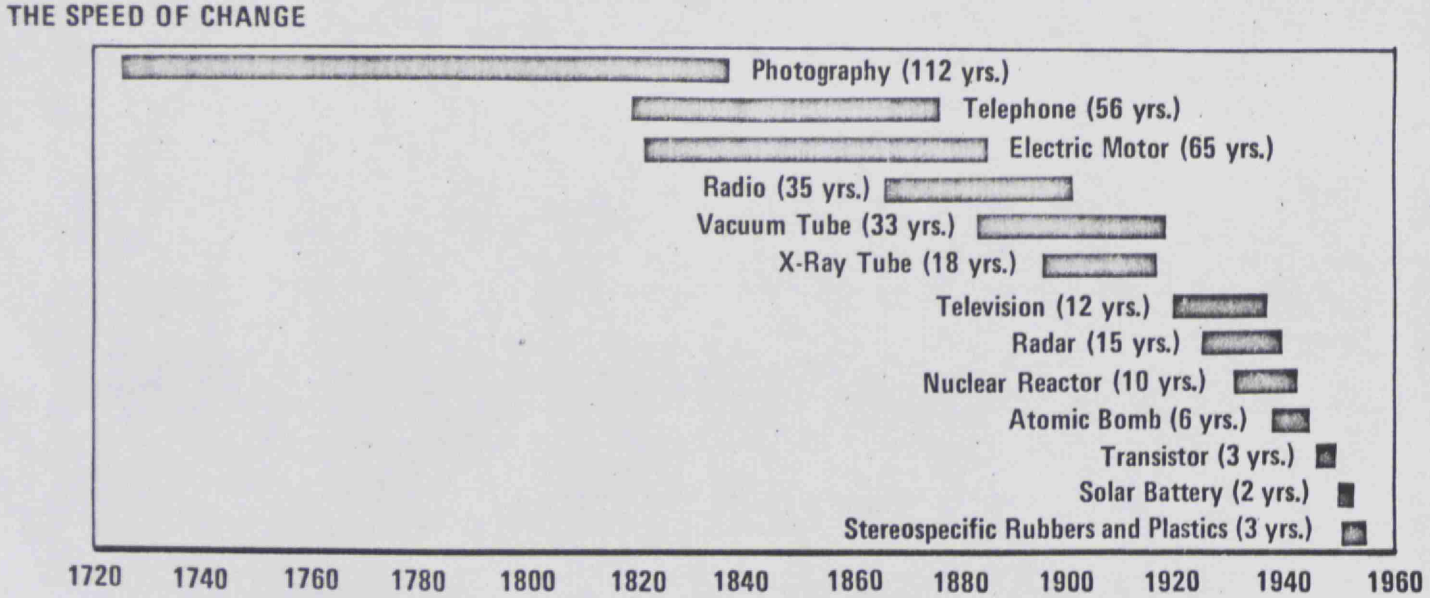
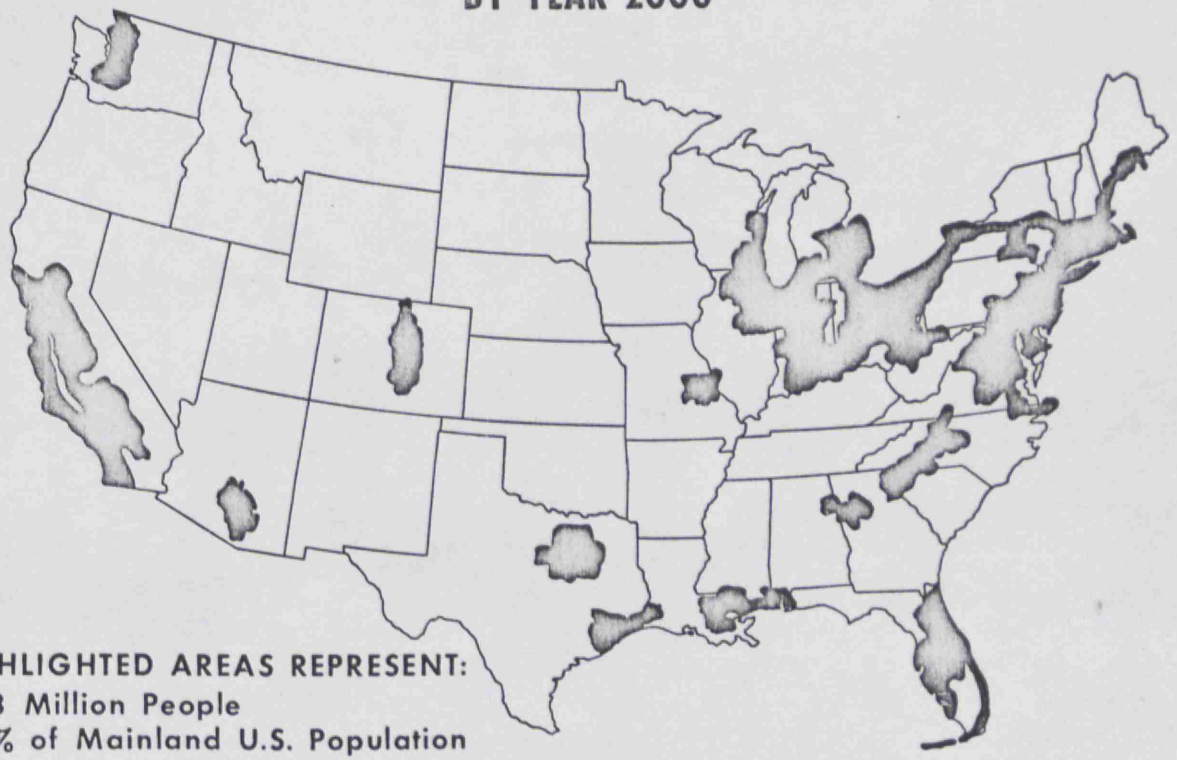


Figure 6

12 MAJOR URBAN REGIONS PROJECTED BY YEAR 2000

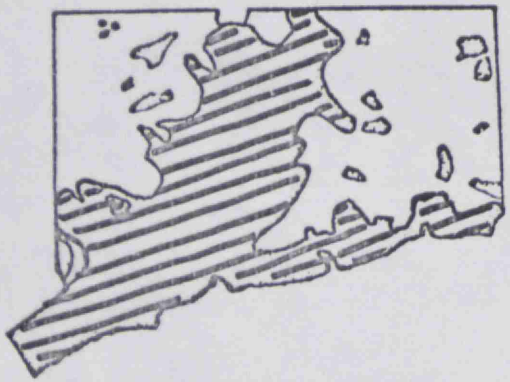


HIGHLIGHTED AREAS REPRESENT:
218 Million People
71% of Mainland U.S. Population

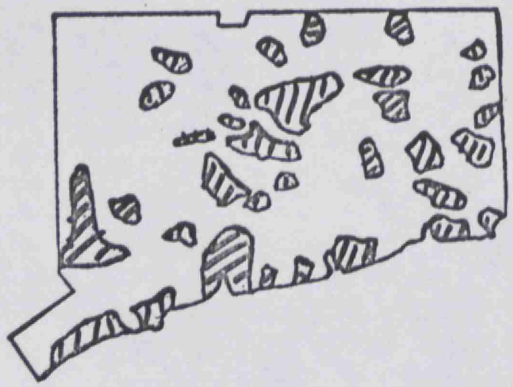
Figure 7

Some Alternatives

alternative land use plans have been analyzed by the Connecticut Interregional Planning Program:



(1.) Trend Projection is a linear extrapolation of historical trends.



(2.) Multiple Urban Centers channels growth into existing or new urban centers separated by open spaces.

Figure 8

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

Date: January 26, 1971

Subject: Backup Information for Use in Discussions with Congressman Joe L. Evins

To: Mr. C. T. Whitehead

1. Pursuant to our discussion on January 6, 1971, attached please find information which might prove of value in discussions with Congressman Evins.

2. The presentation is divided into areas of known particular interest to the Congressman (non-Government -- broadcasting and land mobile, defense, education and TVA). Also included is summary information on the use of the spectrum by non-defense Government interests, both within and outside Tennessee.

Will
W. Dean, Jr.

Attachment

cc. G.F. Manson

BACKUP INFORMATION FOR USE IN DISCUSSION

WITH CONGRESSMAN JOE L. EVINS

INDEX

1. NON-
GOVERNMENT

1. NON-GOVERNMENT USE OF FREQUENCY SPECTRUM IN TENNESSEE

The principal non-government uses of frequency spectrum except for AM radio stations, which use frequencies below 25 MHz, and microwave communications systems, which use frequencies above 890 MHz, are set out on the enclosed chart together with the amount and location of the frequency bands devoted to each use.

Excluding the bands set aside for government use, the frequency spectrum between 25-890 MHz is used primarily for FM radio, VHF and UHF television, aeronautical, amateur, meteorological, maritime, space research, astronomy, radio navigation, certain types of fixed broadcast services, and land mobile communications.

Land mobile communications include those used by police and fire departments, highway maintenance departments, large and small businesses, utility companies, railroads, forest and conservation services, radio, television and newspaper companies for internal communications, truckers, taxicabs and airline terminal operations.

The AM radio, FM radio and land mobile radio uses of the frequency spectrum are the most widely dispersed throughout Tennessee. 93 cities and towns in Tennessee have 139 AM radio stations and 69 FM radio stations. Over 126 cities, towns and counties have radio systems licensed for public safety uses, such as police and county sheriff. In addition, many city fire departments use land mobile radio and there are over 146 licenses issued to cities, towns, counties, and the State of Tennessee for land mobile radio systems for other local government uses.

In the distribution of electric power, there is also a widespread use of land mobile communications, both to meet emergency situations and for efficient general operations. The telephone and water companies use land mobile radio for emergency crews.

The wide variety of land mobile users in the general business and special industrial and manufacturers categories indicate the importance of land mobile communications to both large and small businessmen and their customers in Tennessee. These users include farm implement dealers, auto dealers,

manufacturers of a wide variety of Tennessee products, farmers, fertilizer plants, heavy construction companies, well drillers, home builders, electrical contractors, heating and air-conditioning companies, real estate companies, salvage operators, taxicabs, schools and colleges including church kindergartens, pump service companies, auctioneers, drug stores, food service companies, oil jobbers, nurserymen, soft drink bottlers, ready-mix concrete appliance sales and service, agricultural spraying, pest control, asphalt paving contractors, truckers, scrap metal dealers, road service and towing companies, excavating and land clearing companies, florists, film pick up and delivery, local and long distance movers, coal mines and insurance companies.

The following are some specific examples of land mobile users in Central Tennesee:

Harriman, Tennessee	Roy's Cab
	City of Harriman
McMinnville, Tennessee	Boyd Nursery Company
	Coca Cola Bottling Company
	Forest Nursery, Inc.
	McMinnville Concrete Block Co.
Oneida, Tennessee	West Coal Co.
Crossville, Tennessee	City of Crossville for local government uses
Smithville	DeKalb County
Oak Ridge, Tennessee	City of Oak Ridge
Cookeville, Tennessee	Putnam County
Rockwood, Tennessee	City of Rockwood
Carthage, Tennessee	Pat Eatherly Construction Co.

The increasing use of radio by the wide variety of land mobile users as well as the limited ability to expand the use of AM, FM and VHF radio and television service in Tennessee emphasize the need for adequate management of the entire frequency spectrum, and particularly the under-utilized UHF television spectrum. Almost one-half of the entire frequency spectrum between 25-890 MHz is presently reserved for UHF television in Tennessee, but the use of that spectrum has not developed in the same proportion as the space reserved for it.

As a result, adequate spectrum management concepts should be developed and put into practice in order that the maximum use will be made of the frequency spectrum.

Adequate spectrum management will take advantage of the fact that:

1. Frequency spectrum is not consumed when it is used.

2. Frequency spectrum is wasted when it is not used.

3. Only one use of each segment of the spectrum obtained can be made at a given instant of time at a given location.

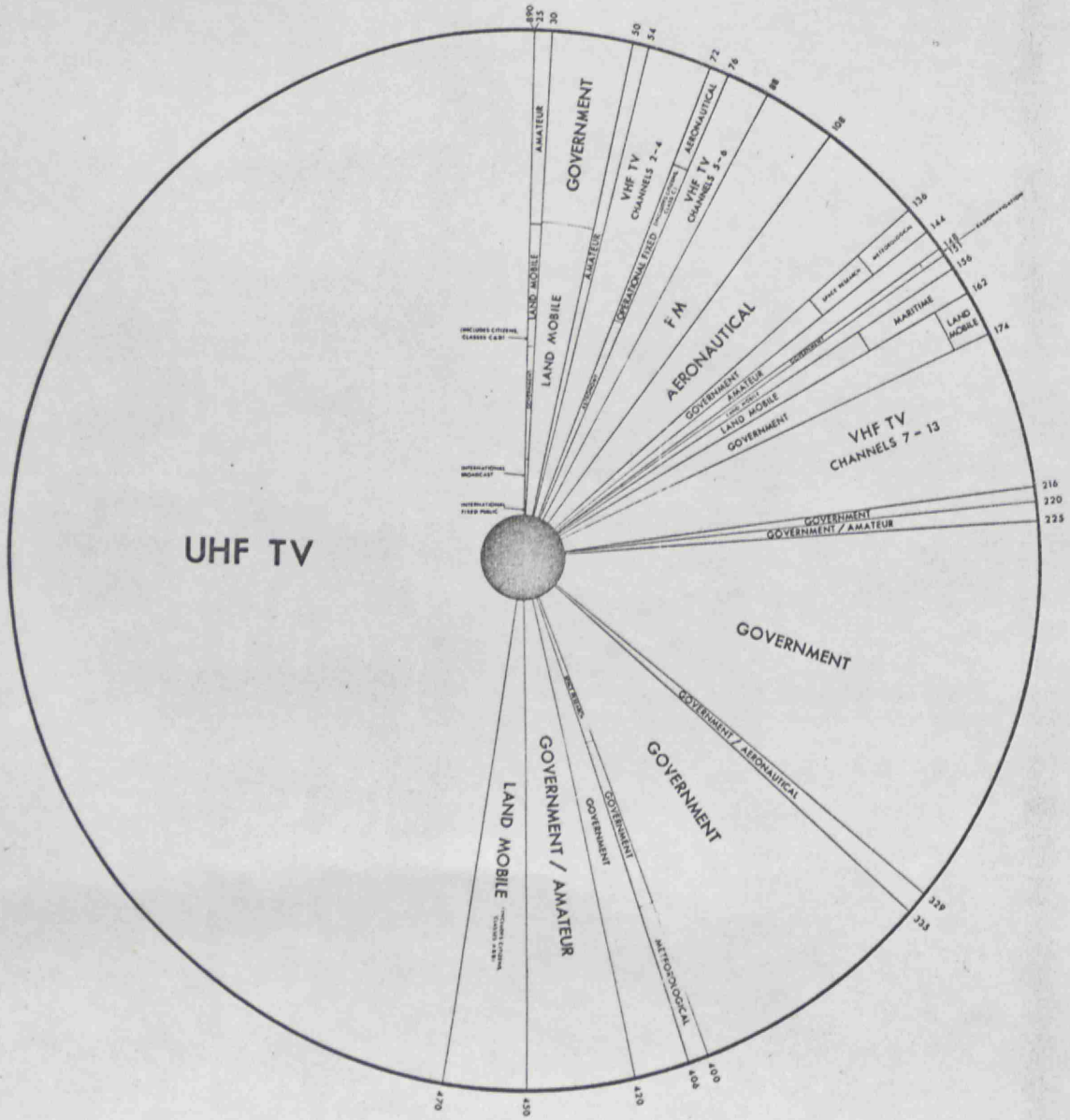
Combining these principles so as to provide the maximum use of the frequency spectrum is the goal of adequate spectrum management. The increasing needs for radio communications make it essential that adequate spectrum management must be undertaken if the needs of the nation are to be met.

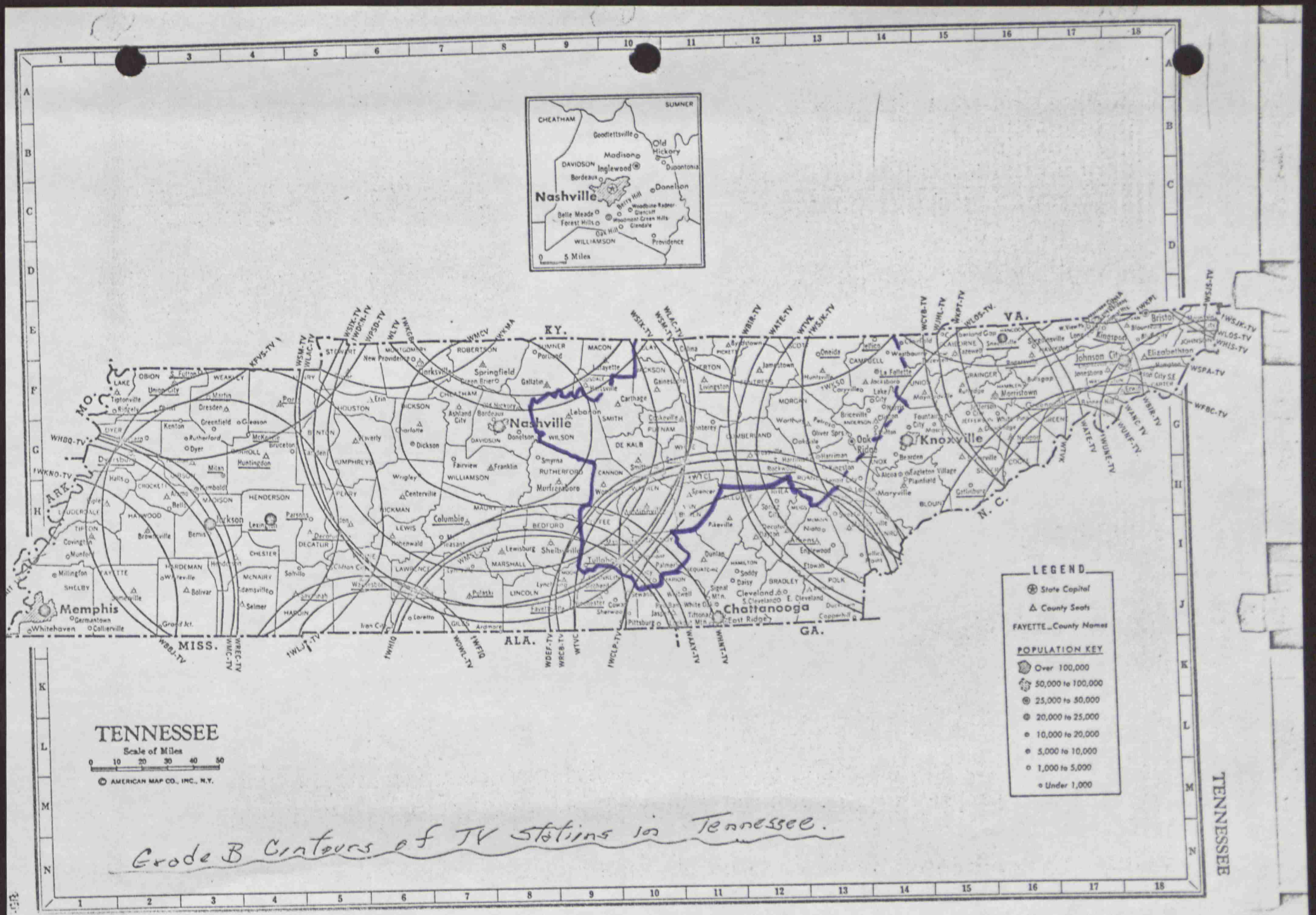
ALLOCATION OF THE FREQUENCY SPECTRUM

BETWEEN 25 AND 890 Mc.

Government
UHF-TV
VHF-TV
FM
Aeronautical
Amateur
Meteorological
Maritime
Space Research
Astronomy
Operational Fixed
International Broadcast
International Fixed Public
Radionavigation
Land Mobile

- Public Safety
  - Police
  - Local Government
  - Fire
  - Highway Maintenance
  - Forestry-Conservation
  - Special Emergency
  - State Guard
- Industrial
  - Power
  - Petroleum
  - Forest Products
  - Motion Picture
  - Relay Press
  - Special Industrial
  - Business
  - Manufacturers
  - Telephone Maintenance
- Land Transportation
  - Motor Carriers
  - Railroad
  - Taxicab
  - Automobile Emergency
- Domestic Public Land Mobile
- Auxiliary Broadcast





Grade B Contours of TV Stations in Tennessee.

TENNESSEE

2. DEFENSE

2. DEFENSE USE OF THE SPECTRUM

The military departments are critically dependent on communications for command and control of world-wide dispersed forces and upon electronics as an integral part of detection and weapon systems. Defense communications-electronics activities include radar (early warning, surveillance, missile control), navigational aids, identification, sensing, and command and control.

The rapid expansion of military communications-electronics may be expressed in terms of dollar investment. In 1941, the estimated total military expenditure for communications electronics was about $10 M, or 2% of factory sales of electronic products. The annual military expenditures rose to $4.4 M or 57% of factory sales in 1958 and in 1970 were $11.12 B, or 43.2% of total sales of $25.8 B. This trend in military expenditures is expected to continue.

The military services are the largest Government users of the radio spectrum, indicated by the nearly 64,000 frequency assignments to the military (53% of all Government assignments within the CONUS) and an estimated investment of $50 B in communications-electronics.

3. EDUCATION

3. EDUCATION

A. Percent of Institutions Using CCTV/ITFS*

Public	45.4%
Non-Public	1.7%
Junior College	7.9%
Higher Education	43.3%
Other	1.7%
TOTAL	100.0% (**717 Institutions)

B. Space Aspects

In preparing for U.S. participation in the World Administrative Radio Conference on Space Telecommunications, the United States is proposing that frequency allocations be provided for communications satellite systems dedicated to the distribution of educational and public service information. This provision was brought about by the acute awareness of educational interests to the benefits of satellite technology in the distribution of educational information on a nationwide basis.

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* CCTV - Close Circuit Television
ITFS - Instructional Television Fixed Service

** Tennessee - 6 elementary and secondary, 6 higher education

4. TENNESSEE VALLEY ADMINISTRATION (TVA)

The TVA currently uses radio in diverse ways to support its operations. The primary use is for the operation and maintenance of the TVA electric power system, which supplies electricity throughout Tennessee and neighboring states.

Additional services provided by communications-electronics are electric power command (pooling electrical resources throughout the country); close coordination with non-Government electrical power sources; development and maintenance of hydrological capabilities, particularly in the area of water quality; safety in the TVA area for large segments of the public engaged in recreational activities; construction and expansion of the TVA system (particularly important in view of the possible adverse effects of high power induction), and the recently emphasized need for protection of the environment. A representative example of TVA's need for radio frequencies is in the attached letter which outlines a requirement for high frequencies to permit TVA to participate in field trials of the electric power-pool command control radio network. The frequency resources required have been provided.

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

FILES

September 16, 1970

Mr. S. L. Windes, Chief
Telecommunications Staff Office
United States Department of the Interior
Office of the Secretary
Washington, D. C. 20240

Dear Mr. Windes:

Thank you for your letter dated August 31, 1970, concerning field trials of the electric power-pool command control radio network.

We have planned that TVA participate in these field trials and of course have been awaiting specific frequency assignments to be cleared before applying to you for authorization to proceed. As you know, we operate as a member of the Southeast Region of NAPSIC and our proposed participation would be in cooperation with this organization. A meeting of the Southeast Region of NAPSIC Communication Subcommittee is scheduled for early October, and I would like to wait until after this meeting to contact you further regarding our wishes in this matter. It would appear that we will be hampered considerably in the Tennessee area until the additional frequencies for daytime use are cleared. In any case, we will contact you in the usual way regarding applications for these field trials.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

T M Swingle

T. M. Swingle, Chief
Communication Engineering and Design Branch

NAPSIC = North American Power System Interconnection Committee.

SEP 22 REC'D

5. OTHER GOVERNMENT AGENCIES

A. Within Tennessee--An extract of Government frequency authorizations for the state of Tennessee indicates the following use by the Federal Government within that state:

AGENCY	NUMBER OF ASSIGNMENTS
Air Force	89
Navy	29
Army	219
Federal Aviation Administration	271
Interior	401
Coast Guard	51
Justice	133
Agriculture	80
Atomic Energy Commission	63
Commerce	23
Transportation	20
Veterans Administration	5
Post Office	13
Federal Reserve System	1
Non Government	12
TOTAL	1410

An example of the type of Government activity in Tennessee requiring communications support is the Department of Interior's National Park Service involvement in the establishment of Natchez Trace (super highway which transits Tennessee and will ultimately link Louisiana with the Blue Ridge Parkway). Spectrum resources for this project are required in the areas of law enforcement and highway construction and maintenance. The National Park Service also provides service to the public in the Great Smoky Mountains in the areas of fire suppression, public safety, wildlife management and in overseeing the several wildlife refuges of the Department's Bureau of Sport Fisheries.

B. Non-Tennessee--Examples of spectrum use by the larger user agencies are:

- The Department of Commerce--In discharging its responsibilities, such as providing weather service to the nation, has 3433 frequency assignments and communications-electronics systems of $90.5 M estimated investment.
- Atomic Energy Commission--The Atomic Energy Commission, in carrying out the purposes of the Atomic Energy Act of 1954, has 2451 authorizations on 820 discrete frequencies.

- Department of Agriculture--Relies heavily on radio in administering and managing 154 national forests, together with 19 national grasslands, land utilization project lands, experimental forests and other lands aggregating about 186 million acres. For example, nearly 20,000 radios are used in the protection and management of our national forests; 652 radios are installed in fire-fighting aircraft; and nearly 900 frequencies are employed in insect and disease control research. The Department has 7350 frequency assignments on 277 frequencies.
- Department of Justice--Uses 6,110 assignments on 376 frequencies in enforcing federal laws.
- Department of Interior--Operates on 7476 assignments, with an estimated equipment investment of about $60 M, in meeting its responsibilities in management and law enforcement. The use of radio is vital in such operations as the National Park Service, the Bureau of Indian Affairs, Bureau of Land Management (nearly 1/5 of the nation's gross land mass), support of the Bureau of Reclamation, Bonneville Power Administration, supervision of the over 28 million acres of Natural Wildlife Refuge System, as well as the administration of the 3 million square miles of ocean involved in governing the Trust Territories.

- The U.S. Coast Guard, Department of Transportation--Currently uses 7277 assignments and has an estimated investment of $350 M in communication electronic installations in fulfilling its responsibilities in search and rescue, merchant marine safety, ice breaking, navigational aids, oceanography, law enforcement and military readiness.
- Federal Aviation Agency, Department of Transportation-Employs over 15,000 frequency assignments and $400 M worth of electronic equipment for communications, radionavigation, and radar in carrying out its responsibility to provide for the safe and efficient use of the airspace by both civil and military aircraft. The FAA provides service to over 2600 air carrier aircraft which have an investment of in excess of $390 M in airborne electronics, 134,000 general aviation aircraft with an investment of over $270 M in airborne electronics, FAA test aircraft with an investment of approximately $9.5 M, and thousands of military aircraft.
- NASA--Is critically dependent on the radio spectrum in meeting its requirements in the research and exploration of outer space. Space radio networks of NASA currently total an estimated $607.5 M. Increased reliance on radio is prerequisite to outer space exploration involving Jupiter and outer planets, communications experiments, conduct of radio

and radar astronomy investigation, and special manned space program activities.

TO THE CONGRESS OF THE UNITED STATES

There have been many significant accomplishments in commerical satellite communications during the 1960's. These include important milestones:

-- Demonstration of the feasibility of satellite communications for practical uses;

-- Enactment of the Communications Satellite Act of 1962;

-- Establishment of the Communications Satellite Corporation;

-- Creation of the International Telecommunications Satellite Consortium (INTELSAT); and

-- Establishment and operation of a Global Commerical Communications Satellite System.

These unprecedented achievements were facilitated by the policy of the United States to make the services attainable through communications satellite technology available to the nations of the world. The outstanding success of INTELSAT is the product of enlightened international cooperation between the participating member nations of the Consortium. Through this cooperative effort was created the INTELSAT system which is today providing international telecommunication services to much of the world.

The rapid progress toward establishment of the global system and the accelerated application of advanced technology have demonstrated the basic soundness of the institutional arrangements in the interim multilateral agreement. This progress has been the result of INTELSAT's effective decision making performance and COMSAT's accomplishments in planning and execution, as Manager for INTELSAT. These achievements are a tribute to human creativity and international cooperation in surmounting the substantial impediments (technical, social, political and economic) normally encountered in the introduction of a new technology.

The full impact of our progress was graphically portrayed when I sat in The White House in July and talked to Neil Armstrong and Edwin Aldrin on the surface of the Moon, an experience shared with people throughout the world through the medium of satellite communications.