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LEGAL ASPECTS OF SATELLITE TELECONFERENCING

by

Delbert D. Smith*

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*Ph.D., Cambridge University, Cambridge, England. J.D.,
The University of Wisconsin. Diploma, The Hague Academy
of International Law, The Hague, The Netherlands. Member
of the Bar, The State of Wisconsin. Legal Advisor, The
Space Science and Engineering Center, The University of
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PREFACE

The development of satellites for communications purposes has tended to greatly expand concepts concerning integrated communications systems. The traditional distinctions within the communications industry are dissolving in favor of new and innovative technologically-based systems. In addition to one-way broadcasting, it has become feasible to consider interactive communication which will allow educational and informational activities to take place on a scale never before imagined. The word "teleconferencing" is used to describe a communications system providing bidirectional communication which has a great potential in the educational area for professionals, remote medical diagnosis, business conferences and computer techniques. A teleconferencing system utilizing a satellite which virtually eliminates distance as a cost factor can provide specialized services to various segments of our society. It is possible that satellites will be developed which are dedicated solely to teleconferencing purposes.

Given the technological possibilities of a satellite teleconferencing system, it becomes necessary to consider the legal framework within which such a system or series of systems could be developed. Thus this work considers

the legal context for satellite teleconferencing regulation, the options available for such a system, the regulatory alternatives, the special case to be made for an educational system and an ownership and management model. A number of options are presented for coping with the technological possibilities and systems configurations since a number of interrelated decisions will need to be made by various governmental and private bodies. It is hoped that this work will be further added to by additional in-depth studies in specific areas.

I am particularly indebted to Dr. D.W. Bowett of Cambridge University, England for initial encouragement in this general area of research, to Dr. V.E. Suomi and Mr. T.O. Haig of the Space Science and Engineering Center for their constant concern and support, and to a large number of people at the National Aeronautics and Space Administration for insight and counsel over a span of years. I also wish to thank Nikola Kostich for research assistance, Larry Chambers and Linda Stephenson for coordination activities, and Nancy Wulfers, Sandra Noe, and Katherine Shervis for their efforts in the preparation of this material. At Stanford University, I am grateful to Dr. Bruce Lusignan for technological grounding and advice, and I also benefited from exchanges with Jim Potter and Ray Panko. Whenever research is done at the interface

between law and technology there must be a truly interdisciplinary research effort and the above people contributed greatly to making this a reality. The responsibility, however, for what follows is solely that of the author in both form and substance.

Delbert D. Smith

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INTRODUCTION

The technological development of a satellite teleconferencing system can be enhanced by a complementary study of the legal aspects of the system development. Following is a study of the legal aspects of satellite teleconferencing which deals with the various management, ownership, and regulatory alternatives. The policy options available for satellite teleconferencing systems are also considered and special consideration is given to the development of an educational satellite teleconferencing system and the special problems that this involves.

Any regulatory regime for a satellite teleconferencing system must take into consideration the existing regulatory modes governing the subsystems employed and also the possibility of creating a new regulatory regime based on the premise that the interconnection of various subsystems results in a new entity requiring an innovative regulatory approach.

The last decade of American history has witnessed significant scientific achievements, among which are vital developments in the area of communications technology. The development of new technology is seriously challenging the existing configuration of the communications industry. Communications satellites are a prime example of a new technique which tends to blur the traditional divisions of functions between various segments of the communications industry. Likewise the use of digital computers removes the well-defined borders separating the communications industry from the data processing industry.

The new technologies have made possible the development of new communication and information services which enable individuals, or machines appropriately programmed by individuals, to communicate with each other, and the individuals to furnish and control the content of the messages which are transmitted. An example of such a service is a satellite teleconferencing system, equipped to provide bidirectional communication and allowing individuals (or machines) situated in diverse locations to reach common solutions to problems. The use of teleconferencing techniques has a great potential in providing services such as continuing education for professionals, remote medical diagnosis and consultation,

professional society meetings, business conferences, and various computer techniques.

The development of satellite teleconferencing systems will present a challenge to the present structure of the communications industry. What will be the legal, and necessarily politico-economic, framework within which conflicts over the distribution of new business opportunities will be decided? What should be the goals of government regulation with regard to such distribution?

In the development of a teleconferencing system there are a number of interests that will need to be balanced as new suppliers of services enter the market.

However,

"The current market structure (of the communications industry) provides a setting in which the existing common carriers, on the one hand, and the potential entrants on the other, pursue conflicting courses of action, subject to the constraints of highly imperfect markets and regulation."¹

Teleconferencing Systems Components

In order to comprehend the present structure of the communications industry and the problems which will face any proposal for a teleconferencing system, it is essential that the differences between several categories of electronic bi-directional communications be properly understood. The technical explanation of teleconferencing techniques may be somewhat rudimentary, but it may provide a sound basis for a discussion of policy implications of each available method.

A satellite teleconferencing system will use transmission techniques which have been used to some extent. These are: satellite transmissions, microwave relay systems and coaxial cable. By listing them separately it is not intended to suggest that an exclusive choice of the three must be made. The manner of listing only suggests that distinct issues are presented by each method, and that they must be fully considered in any system which is a mix of two or even all three techniques.

Of all the various transmission methods the most promising is the communications satellite. While the cost of using cable and microwave relays varies in proportion to the distance covered, the cost of satellite communication is almost independent of distance. A transmission beamed up to it from any point on the surface below can be relayed back down to any other point. Of course the transmission to the sending earth station and its retransmission to the receiving station (except in the case of direct broadcast satellite) needs additional ground facilities.

The communications satellite actually contributes a new dimension to the existing communications technology. It can to some extent replace terrestrial communications cable and microwave systems in the transmission of vast amounts of information, including facsimile, voice, data, and television.

The factor which accounts for the satellite's great capabilities is its unique spatial relationship with the earth, rather than any unique electronic features. In fact, electronically, the communications satellite resembles, both in its use and function, the terrestrial microwave tower - its electronic circuitry is basically identical with a microwave relay tower, and it is, in effect, a microwave tower in orbit.

The transmission medium for microwave relay is radio transmission through the atmosphere of the earth. Microwave relay operates in the portion of the radio spectrum extending into the gigahertz range. There is no ground-wave or sky-wave characteristic, that is the waves neither follow the curvature of the earth nor are reflected from the ionosphere; therefore, transmission must be by clear line of sight. The microwaves are focused through the use of directional antennas and beamed from one relay tower to the next. The relay towers are constructed at intervals of about twenty-five to thirty miles so that the horizon does not absorb the signal. Microwave is used to transmit a wide variety of information such as voice, telegraph, teletype, facsimile, digital data and television.

Although satellite transmissions make use of the same microwave band as is used by the terrestrial microwave system, interference with the ground signals is

unlikely due to the following factors. First, the satellite beams a relatively weak signal which will not be picked up by the comparatively small antenna of a microwave tower. Secondly, each tower operates on a line-of-sight with the next one in the system, with an angle of reception of about one degree. For this reason, the satellite, in order to cause interference to the tower would have to be in an unlikely position just above the horizon so as to face directly into the tower. This situation may change in the future with the development of more powerful satellites.

In describing the above-mentioned techniques, satellites and microwave relay, it is important to emphasize that they require an over-the-air broadcasting system. This necessarily calls for utilization of a portion of the electromagnetic spectrum which is already intensively used.

In recent years there has been a trend of thinking toward removal of a portion of electronic communications from over-the-air broadcasting systems to the cable system. The future of the cable system is greatly enhanced by the development of the coaxial cable. This cable can carry an enormous range frequencies thus being able to provide a link for a million simultaneous telephone conversations without mutual interference.² The coaxial

cable is only one element in providing longer distance transmission. The cable serves as a physical link between reflector stations placed at twenty mile intervals which boost the signals to make up for the losses in the line. There is also the need of terminal equipment which merges at the sending end and sorts out at the receiving end the hundreds of transmissions passing along the single wire inside its hollow tube. With properly designed reflectors there is no practical limit to the distance over which transmissions can take place.

In considering a satellite teleconferencing system, it is apparent that there are a number of parts to the entire system. The discussion above considered briefly the transmission alternatives. Another way to break down this part of the system is to consider the space segment and the ground segment. In the space segment one has to consider the satellite itself and the availability of circuits, and possibly even the cost factor for the launching of the satellite if a dedicated private system is contemplated. On the ground segment consideration must be given to the microwave or coaxial cable system that is to be used, and the extent to which an ITFS or CATV system will be used. Microwave and coaxial cable are primarily under the control of communication common carriers while

CATV systems in particular have not been made the subject of definitive FCC regulation.

A secondary factor in a teleconferencing system is the software production. Specialized terminal devices may be developed to meet specific users needs which will not fall within any current categories or regulation.³ In addition there will be a need for content development and specialized services which must be either sold to the user or provided by some funding agency.

Any discussion of the above alternatives bears in some part on the users that are being contemplated for the satellite teleconferencing system. If the users are primarily in the governmental sector then one type of system will be developed. If the users are in the educational community then other standards and funding problems arise, and concomitantly other regulatory problems. Finally, if the users are primarily in the private sector then yet another system configuration will arise. Thus the ownership and management alternatives may depend primarily on the categories of users that are identified.

In the user studies conducted at the University of Wisconsin it was found that the majority of current users of teleconferencing systems are from the educational community with some use being made by private industry.

Even the use of teleconferencing systems by professionals such as doctors and lawyers now centers around the educational function and the services themselves are provided by educational institutions and the costs are shared by the users and the providers of the systems. A breakdown of these services into the technology utilized, the cost, and the funding source follows.

FOOTNOTES

1. Harry M. Trebing, "Common Carrier Regulation - The Silent Crisis," 34 Law and Contemporary Problems 299, at 318.
2. National Academy of Engineering, "Communications Technology for Urban Improvement," June 1971, p20.
3. Volk, J., "The Reston, Virginia, Test of the MITRE Corporation's Interactive Television System," May, 1971.

THE LEGAL CONTEXT FOR SATELLITE TELECONFERENCING REGULATION

A satellite teleconferencing system will be subject to existing federal regulation if the FCC finds it to be a common carrier communications activity as defined in the Communications Act. Section 203(a) provides:

Every common carrier ... shall ... file with the Commission and print and keep open for public inspection schedules showing all charges for itself and its connecting carriers for interstate and foreign wire or radio communication. . . .¹

Section 203(c) continues:

No carrier, unless otherwise provided by or under authority of this chapter, shall engage or participate in such communication unless schedules have been filed²

These sections raise two questions of definition: first, whether a satellite teleconferencing service constitutes "wire or radio communication," and second, whether the entity that provides the services is a "common carrier."

Section 3(a) of the Communications Act defines "communication by wire" as

the transmission of writing, signs, signals, pictures, and sounds of all kinds by aid of wire, cable, or other like connection between the points of origin and reception of such transmission, including all instrumentalities,

facilities, apparatus and services (among other things, the receipt, forwarding and delivery of communications) incidental to such transmission.³

"Radio communication" is defined by section 3(b) to mean the transmission by radio of the same communications described in section 3(a), and to include the same incidental services and facilities.⁴

It is apparent that a satellite teleconferencing system would be involved in radio communication and communication by wire. If the satellite communication linkage were considered to be the primary service and the interconnection with CATV or microwave as services incidental to the satellite transmission, it would still be arguable that the entire system could be regulated as a common carrier.

Another justification for common carrier regulation would involve a satellite teleconferencing system that was interconnected to telephone lines.

Section 202(b) of the Communications Act provides that:

services, whenever referred to in this chapter include ... services in connection with, the use of common carrier lines of communication, whether derived from wire or radio facilities, in chain broadcasting or incidental to radio communication of any kind.⁵

Thus the satellite, CATV, or microwave portions of the system might fall under common carrier regulation be-

cause of their use in connection with the use of common carrier lines.

If a satellite teleconferencing system was involved in data processing or other activities which involved the transformation of signals, this part of the system might be considered to be beyond the scope of the Communications Act.⁶ However, the above references to the "services in connection with" might invalidate this argument.

The "Common Carrier" Concept

The definition of common carrier in Section 3(b) of the Communications Act states that:

"Common carrier" or "carrier" means any person engaged as a common carrier for hire, in interstate or foreign communication by wire or radio or in interstate or foreign radio transmission of energy, except where reference is made to common carriers not subject to this chapter; but a person engaged in radio broadcasting shall not, insofar as such person is so engaged, be deemed a common carrier.⁷

The phrase "any person engaged as a common carrier for hire" is not further defined in the Communications Act, and the legislative history of the Act indicates only that press associations are to be excluded and "that the definition does not include any person if not a common carrier in the ordinary sense of the term...."⁸

Historically, the phrase "common carrier" has been used to refer to the carriage of freight and passengers by stage coaches, motor vehicles, railroads, and airlines as well as the carriage of communications and other public utility services. One characteristic of these services was that they were provided by

one who holds himself out to the public as engaged in the business of transportation of persons or property from place to place for compensation, offering his services to the public generally. The distinctive characteristic of a common carrier is that he undertakes to carry for all people indifferently....⁹

The requirement that there be a general holding out to the public has been used by the FCC to define the common carrier concept. In one of the early cases dealing with community antenna television systems, the Commission described a communications common carrier in the following terms:

Fundamental to the concept...is that such a carrier holds itself out or makes a public offering to provide facilities by wire or radio whereby all members of the public who choose to employ such facilities and to compensate the carrier therefore may communicate or transmit intelligence of their own design and choosing....¹⁰

The requirement that a common carrier in the transportation industry hold itself out to the public generally was accompanied by a requirement that the carrier charge uniform rates.

[T]here has been no such holding out if, in the regular operation of that business, the carrier, by act and deed, with or without words, claims to and exercises the right to fix specific rates in each individual case basing the charge not on a regular schedule (whether formally filed as tariffs or otherwise), but on contemporary judgment of the moment. For this is an effectual announcement that the carrier will discriminate, will undertake transportation differently not indifferently.¹¹

Hence, while a common carrier is required to offer a service indiscriminantly, it is allowable to have specialization in one class of goods or an offering to a specific segment of the public so long as that offering is indiscriminant within that segment. If a dedicated satellite were used for an educational teleconferencing system, this line of reasoning would possibly require that it be regulated as a common carrier since the educational community could be defined as a specific segment of the public. The same argument might apply if the business community, or the professional communities were segmented for a satellite teleconferencing service. However, if the rate structure involved in the various services that a satellite teleconferencing service could supply were varied depending on the users' capability to pay then the indiscriminate rate requirement would not be present.

This leads to a discussion of the nature of the service to be provided by a satellite teleconferencing

system. The determination of the service provided may be the basis for a determination of whether a particular entity is a communications common carrier.¹²

In an early CATV controversy the FCC developed a distinction between communications whose content is determined by the user of the service, and communications whose content is determined by the carrier.¹³ In a communications common carrier service

the carrier provides the means or ways of communication for the transmission of such intelligence as the subscriber may choose to have transmitted. The choice of the specific intelligence to be transmitted is...the sole responsibility or prerogative of the subscriber and not the carrier¹⁴

The CATV system in Frontier Broadcasting Co. v. Collier¹⁵ was held not to be a common carrier service because "the specific signals received and distributed by the CATV system are, of necessity, determined by the CATV system and not the subscriber."¹⁶

In Subscription Television Inquiry,¹⁷ this distinction was stated another way:

It has been a fundamental concept in the communications field that a person is not a "common carrier" of communications where he is providing his subscribers primarily with a news or information service, rather than with a communication service enabling subscribers to communicate among themselves. Thus for example, while the furnishing of leased wires or radio circuits by the telephone or telegraph carriers is part of their common carrier activities, the use of such leased wires by the news services to transmit

news to their subscribers, or by the stock exchange to transmit price quotations has been held not to involve common carrier operations.¹⁸

The above quotation could be interpreted to mean that an interactive satellite teleconferencing system which allows participants to communicate among themselves is in fact a service similar to that offered by a common carrier. Alternatively, the providing of computer printouts, weather displays or other one-way visual or audio information may be beyond the scope of common carrier regulation.

Generally, the FCC is empowered to do whatever is necessary to carry out its functions once determined. Sections 4(i) and 303(r) of the Act provide:

The Commission may perform any and all acts, make such rules and regulations, and issue such orders, not inconsistent with this chapter, as may be necessary in the execution of its functions.¹⁹

[T]he Commission...shall--[m]ake such rules and regulations and prescribe such restrictions and conditions, not inconsistent with law, as may be necessary to carry out the provisions of this chapter....²⁰

Although a liberal interpretation of these sections would indicate the existence of extensive regulatory authority, this authority has been construed narrowly to allow only those actions reasonable and necessary in carrying out the statutory powers.²¹ Denials of

licenses and threats of denials are the only sanctions available to the Commission; it cannot order the disaffirmance of a specific contract,²² nor can it base regulation on a broader interpretation of a criminal statute than Congress intended,²³ even though the interpretation might reasonably cure existing defects or ills in the field.²⁴

If the FCC does choose to adopt a special regulatory regime for a satellite teleconferencing system, its control will be circumscribed by the authority granted in the Communications Act,²⁵ in the same manner that all other agency power is granted.²⁶ The real question is whether the necessity for regulation exists within the context of broad economic and political parameters. Would control over this satellite service be consistent with the rationale of the Communications Act? Under which conditions will the industry prosper and grow? If rapid, efficient service with adequate facilities at a reasonable cost were to be provided under open competition, then a reasonable approach would call for freedom from regulation. The opposite would be true if it could be shown that regulation was a necessity for the protection of the public interest.

Several of the problems of interpretation raised above have been considered in relation to FCC attempts

to exert jurisdiction over the activities of community antenna television cable television systems,²⁷ and it would appear that some of the arguments apply with equal force to a satellite teleconferencing system. Although there seemed to be a predisposition towards liberal construction of the Act in the cable television controversy,²⁸ based on a desire to prevent practices inimical to the public interest, the FCC still has to base its regulation on a specific provision in the Communications Act.²⁹ The Commission does not have the power to regulate all business activities that have an effect on a regulated service.³⁰

It might be possible to introduce a reliance argument into the satellite teleconferencing regulation area in much the same way that this was done with regard to early cable television systems. The alleged reliance of the parties was evidenced by their economic investment in a system that subsequently was found to be subject to a regulatory scheme that would have adversely affected their investment.³¹ The Commission balanced this reliance against concern for the "substantial economic threat" posed by cable television to other segments of the communications industry.³² Unable to obtain congressional guidance

relative to cable television, the FCC was forced to rely on the powers of implied agency that give the Commission authority to deal with aligned activities that might affect a regulatory system entrusted to the agency.³³ The obvious difficulty with discretionary action of this kind is that it must be based on a determination of the public interest that can easily be distorted in a given situation.³⁴

Not all activities affected with a public interest are subject to regulation,³⁵ even when undertaken by communication common carriers. However, when a communications common carrier performs a nonregulated service, it is required to file a statement with the FCC giving a "description and full particulars" of the service.³⁶ This disclosure requirement for any new service provided by a communications common carrier, whether covered by a tariff or not, may result in a competitive disadvantage, since noncarriers providing the service will not have to file a report. In the case of a satellite teleconferencing system using common carrier lines, the publication of operational particulars, pricing structures, and the full extent of services offered might mean that systems not utilizing common carrier lines could develop competitive services based on

information made public by the carrier. On the other hand, it is in the public interest to have the FCC scrutinize the activities of communication common carriers in order to prevent attempts to avoid tariffs on services that should be regulated.

The Economic Policy Considerations: Natural Monopoly

Economic policy decisions may make a great difference in the development of a satellite teleconferencing system. Growth may be more rapid in a regulated environment or in the free market. The determination of which market configuration is best will be resolved partially based on an examination of concepts of "natural monopoly" and "public utility."

Natural monopolies are exceptions to the generally competitive nature of the American economy. They are justified when necessary to secure vital national objectives,³⁷ or when competition would produce inferior service and costly duplication of facilities in a field where there are no viable alternatives open to the consumer and the service itself is a virtual necessity like electricity, gas, or water.³⁸ In the case of a natural monopoly, the alternatives available to the government are to instigate public ownership of the facilities or to develop schemes for public regulation.

Historically, the option of public regulation has been more often relied upon³⁹ and a case-by-case approach has been used to determine the need for regulation.⁴⁰ The difficulty with any broader approach is that once regulation has been instituted it is virtually impossible to redevelop a competitive market.⁴¹ Common regulatory methods include the imposition of special rules and regulations designed to prevent consumer exploitation and harmful competition. In addition, regulation may be accomplished by limiting the number of entities that may provide the service.

Natural monopolies are characterized by barriers to market entry such as the need for a high fixed capital investment, state franchise or licensing requirements, a limited source of supply, heavy constant costs, decreasing average costs, large plant size, centralization of supply, rigid price structures, a low risk factor, and an obligation to meet all demands for the service.⁴² There is obviously a high fixed capital investment for the satellite and launching, and there is also a state franchise required for CATV operation. It is problematical whether the other criteria apply.

Public utilities are natural monopolies affected with the public interest which are called "public

service corporations" or "quasi-public corporations" to indicate that the public has a special interest in ensuring the performance of specific services at reasonable prices.⁴³ In specific circumstances, public carriers, stockyards, and water mills, as well as gas, water, and electricity suppliers have been considered public utilities.⁴⁴

Historically, the traditional forms of communication have been regulated as public utilities possessing natural monopoly characteristics:

The history of the domestic telegraph industry... indicates that competition...has not had the expected and desired effects. Competitive practices have resulted in useless paralleling of facilities, duplication of operations, and wasteful expenditures of resources and manpower.... Moreover, telegraph services appear to fall within the field of "natural monopolies" such as the telephone, power and gas distribution utilities, where it has usually been found by experience that one company adequately regulated can be expected to render a superior service at lower cost than that provided by competing companies.⁴⁵

Additionally, regulation of communications carriers has been justified on the ground that price competition would be destructive and result in economic waste.

Broadcasting is not a common carrier activity,⁴⁶ although it is subject to licensing requirements based on the "public interest, convenience, and necessity...."⁴⁷

In contradistinction to communication by telephone and telegraph, which the Communications Act recognizes as a common carrier activity

and regulates accordingly in analogy to the regulation of rail and other carriers by the Interstate Commerce Commission, the Act recognizes that broadcasters are not common carriers and are not to be dealt with as such. Thus the Act recognizes that the field of broadcasting is one of free competition.⁴⁸

Apparently broadcasting was found not to embody the destructive competition and discriminatory rates that were feared from the transportation common carriers.

The extent to which the Communications Act requires that common carriers be protected from competitive harm is unclear. But it has been suggested that the "just and reasonable" standard⁴⁹ applicable to the tariff provisions of common carriers does not permit as much "fostering of competition per se"⁵⁰ as the "public interest, convenience, and necessity" standard⁵¹ applicable to broadcasting.⁵² This distinction may indicate the relative degrees of competitive freedom available under a system of tariff regulation and a licensing scheme.

Within the broad range of diverse computer information service, certain offerings more closely approximate natural monopolies than others. For example, it has been pointed out that a medical information network has analogies to a regional electric power system,⁵³ and that a case-law data band has monopolistic characteristics on even a national scale.⁵⁴ But most computer information

services do not satisfy the conditions for natural monopolies. Market entry is relatively easy, and a substantial number of varied firms, including computer manufacturers and service bureaus, have entered the field.⁵⁵ Only a small initial outlay for hardware may be required under the rental plans that are available.⁵⁶ Costs vary, depending on the expenses of research and development and the nature of the service that is to be provided. While costs may be decreased by sharing a computer's memory capacity, the expense of communications lines, which varies with distance, may necessitate regional operations on a moderate scale. Given the expense of software and the technical limitations on memory capacity,⁵⁷ even average costs may not decrease as production increases.

One of the factors in considering whether a satellite teleconferencing system ought to be treated as a public utility is whether the rapid rate of technological change will limit the life of the system to any great extent. If so, and there is a concomitant need to constantly revise and adjust the services to conform to specialized customer needs, then it is likely that competition should be allowed within the area. Providing a multitude of specialized services requires a flexibility of structure that is significantly different from the limited services offered by public utilities.

The availability of alternative services should also be a consideration when public utility status for a satellite telecommunications system is being proposed. If the services provided are not necessities then it can be argued that less efficient services involving radio and television could be used. On the other hand if the satellite system is used for basic educational activities and social services then an argument can be made to the effect that public utility status is necessary to ensure that all segments of the population will be provided with similar opportunities. One of the tests should be whether if a new firm were to move into the satellite teleconferencing market whether the first firm would go out of business or whether improved service and reduced rates would result. Further, would increased business result from an additional entry into the area? In this context regulation would act as a barrier against innovation by standardizing services and freezing further research and development.

A compromise in regulation for a satellite telecommunications system might be to provide for free market entry for any interested firms, but with the requirement of full disclosure which would protect the public interest without complicating or unnecessarily hindering industry development. If the profit margins

reported were too high or if services were being denied to significant segments of the population then stronger regulatory measures could be instituted.

Another consideration in the regulatory area might be the extent to which different types of firms might be interested in the development of a satellite teleconferencing system. If there were a large number of different firms interested in the system development then it would be obvious that free market entry ought to be considered. If only one firm indicated interest then public regulation ought to be considered.

New Technology and Competition

The premise that communications services should be a natural monopoly has been challenged in the recent years by a combination of economic growth and technological change. The new technology centered around microwave transmissions, satellite systems, the computer, and related services such as remote facsimile, remote xerography and the teleprinter. Many of these techniques were developed in publicly financed research and development efforts by private concerns, and hence the common carriers no longer possessed the sole expertise in components fundamental to their facilities and networks.

The manufacturers of the new equipment present a potential challenge to the established integrated

hardware suppliers. Entry of new firms is possible in the area of terminals, local loops, switching centers, and transmission trunks. Also, various microwave relay system firms and computer firms are prepared to offer their services. However, given the existing market structure of the communication industry, most of them have faced difficulties, although the FCC has made some significant inroads towards establishing competition.

The first effort to re-introduce competition came in 1956 when private users asked the FCC for access to segments of the radio spectrum for non-common carrier service. At issue were the radio frequencies above 890 megacycles; hence this was known as the "above 890" case. The potential entrants reasoned that there was sufficient space available in the spectrum and that overcrowding would not result. The carriers argued that the radio spectrum was a scarce resource and that their needs were paramount. They also argued that selective entry would result in cream-skimming and significant revenue losses. The FCC issued its decision in 1959 liberalizing entry policy by permitting non-common carriers to utilize the above 890 megacycle frequencies in their point-to-point microwave relay system.⁵⁸ With this action the FCC had eliminated

access to the radio spectrum as a major barrier to market entry. It also gave additional choice to users with a large bulk communications traffic and opened the market to independent suppliers of equipment.

Another attempt to reinstate competition occurred in 1964 when Microwave Communications, Inc. (MCI) applied to the FCC to operate a customized point-to-point microwave system between Chicago and St. Louis. According to the firm, the facilities would effect a cost reduction of 50-90 per cent over carrier rates. No imposition would be made on the subscriber's use of its channels. A subscriber could employ the system for voice, data, teletype, or facsimile and would be permitted to own and attach equipment to the network. Finally, MCI would permit users to share circuits or use them on a part-time basis.

All the carriers opposed MCI's application on the grounds of wasteful use of the spectrum, and that the facilities would duplicate those of the carriers. They also questioned MCI's financial position, its technical competence, and suggested that its cream-skimming operations would result in increased rates to the general public.

In 1970, the FCC granted MCI a license by a vote of four to three.⁵⁹ The Commission permitted MCI

to develop a new communications sub-market not presently served by the carriers. It was held that MCI's emphasis on channel flexibility and circuit sharing would yield economies of cost and specialization that outweighed problems of frequency consumption. The FCC's decision enhanced the market opportunities of non-integrated suppliers and manufacturers of related communications equipment.

As a result of the MCI decision, some 1,700 microwave station operations are now pending before the FCC. The applicants fall under two categories: those seeking to render carrier service via point-to-point communications, and those seeking to establish a switched digital network throughout the United States. If the above applications are granted it would enlarge the equipment supply market leading to easier entry and more competition. It would also stimulate innovative efforts. Finally, the independent supplier would be put on equal footing with the integrated suppliers.

The FCC efforts to broaden the equipment market also extend to the foreign attachment and interconnection area. AT&T Tariff No. 132 states: "No equipment, apparatus, circuit or device not furnished by the telephone company should be attached to or connected with the facilities furnished by the telephone company, whether physically or induction or otherwise."

This tariff ban has included microwave, data sets and telephone instruments. The common carriers argue that the use of customer-owned equipment infringes on the carrier's responsibility, lowers circuit quality, and constricts the innovation process of the carrier. Counter arguments consider the foreign attachment tariff as illegal tie-in between equipment and lines which perpetuate the restrictive structure of the industry. It is argued that equipment procurement in a competitive market would result in greater innovation in equipment with minimal hinderance to the carriers' systemic integrity.

In the mid-1960's, the Carter Electronics Company began marketing a device that enabled a private mobile radio system to interconnect with the public telephone dial network. Called the Carterphone Device, the equipment fell within the foreign attachment category. Bell informed its customers of the violation, and since some 3,500 devices had been sold, the case was assigned to the FCC on the grounds of primary jurisdiction.

In 1968, the FCC ruled that AT&T's foreign attachment tariff, as applied to the specifics of the Carterphone Decision, was unreasonable and unduly discriminatory.⁶⁰ The Commission accepted Carterphone's reasoning that the device fulfilled a useful and necessary

purpose and did not adversely hinder the operation and quality of the telephone network. The FCC also suggested that the carriers should establish more precise and reasonable standards to protect the quality of the telephone system.

The decision has forced AT&T to revise tariffs permitting Carter ownership of data modems, private PBX systems, and private point-to-point microwave relay systems. However, the carriers still prohibit all interconnections in such areas unless the users lease the network control signalling devices (units which perform the dialing function) from the carriers.

The implications of the Carterphone case remain unclear. The key issue is whether the decision clearly will determine the market opportunities of new equipment suppliers. There is also the possibility of extending the decision into the residential market and the computer devices and related equipment offerings.

The trend will be indicated by future FCC decisions. By delivering interpretative rulings on many of the applications presently pending, the Commission could indicate the criteria which would govern the interconnection and foreign attachment tariffs. However the FCC's formal function, the adjudicatory proceeding

is rather cumbersome and lengthy, and taxes the agency's limited resources. Thus any remedial program should couple the formal FCC actions with actions on other fronts. Much depends on the formulation of public policy and the alternatives available for the reform of the communications industry.

FOOTNOTES

1. 47 U.S.C. § 203(a) (1964) (emphasis added).
2. Id. § 203(c).
3. Id. § 153(a) (emphasis added).
4. Id. § 153(b).
5. 47 U.S.C. Sec.202(b) (1964).
6. Section 3 of the Act defines both wire and radio communications as "the transmission of writing, signs, signals, pictures, and sounds of all kinds." This definition does not extend to the transformation of data or intelligence, at least for any purpose not directly contributing to the efficient and accurate transmission of messages from one person or location to another. The transforming functions performed in the processing of data, such as analyzing, classifying, correlating, sorting, calculating, summarizing, producing records and reports, and constructing and applying formulae are not "transmission" and are therefore not communications services within the meaning of the Act.

The data processing business, like most other activities, often has significant incidental communications aspects, but this does not convert the data processing to communications.

Letter from Burke Marshall, Vice President and General Counsel, International Business Machines Corp., to B.F. Waple, Secretary, FCC, Feb. 15, 1966, at 2.
7. 47 U.S.C. § 153(h) (1964).
8. H.R. CONF. REP. NO. 1918, 73d Cong. 2d Sess. 45-46 (1934).
9. Kelly v. General Elec. Co., 110 F. Supp. 4,6 (E.D. Pa. 1935) cited favorably in Tilson v. Ford Motor Co., 130 F. Supp. 676, 678 (E.D. Mich. 1955).

10. Frontier Broadcasting Co. v. Collier, 16 P & F RADIO REG. 1005, 1008 (1958).
11. Home Ins. Co. v. Riddell, 252 F. 2d 1,4 (5th Cir. 1958). See also McCallum v. United States, 298 F. 373 (9th Cir.), cert. denied, 266 U.S. 606 (1924).
12. Cf. Washington ex rel. Stimson Lumber Co. v. Kuykendall, 275 U.S. 207, 211-12 (1927).
13. Frontier Broadcasting Co. v. Collier, 16 P & F RADIO REG. 1005 (1958); CATV & Repeater Servs., 26 F.C.C. 403 (1959); WSTV, Inc. v. Fortnightly Corp., 23 P & F RADIO REG. 184 (1962); Industrial Radiolocation Serv., 8 P & F RADIO REG. 2D 1545 (1966); all cited in Computer Services, supra note 3, at 340-41 nn. 54-55.
14. Frontier Broadcasting Co. v. Collier, 16 P & F RADIO REG. 1005, 1009 (1958).
15. 16 P & F RADIO REG. 1005 (1958).
16. Id. at 1009.
17. 7 P & F RADIO REG. 2D 1501 (1966).
18. Id. at 1513.
19. 47 U.S.C. § 154(i) (1964).
20. Id. § 303(r).
21. Cf. Federal Radio Comm'n v. Nelson Bros. Bond & Mortgage Co., 289 U.S. 266, 281 (1933); Clear Channel Broadcasting Serv. v. United States, 284 F. 2d 222 (D.C. Cir. 1960) (upholding order that was broad, but not "arbitrary, capricious, or an abuse of the Commission's discretion"); Bendix Aviation Corp. v. FCC, 272 F. 2d 533 (D.C. Cir. 1959) (sustaining denial without hearing of application for experimental use of particular frequency for development of airborne aircraft collision-preventive system on grounds that FCC action pursuant to §§ 4(i) and 303(r) among others was not arbitrary or capricious).

22. Regents of Univ. Sys. of Georgia v. Carroll, 338 U.S. 586, 600 (1950):

One suggestion is that petitioner's position has a specific statutory basis in § 303(r), which permits the Commission to prescribe such "conditions" as are "necessary to carry out the provisions" of the Act. We do not think the suggestion is sound. Congress has enabled the Commission to regulate the use of broadcasting channels through a licensing power. It is in connection with this power that § 303(r) is to be interpreted.

23. FCC v. American Broadcasting Co., 347 U.S. 284 (1954).

24. With regard to lotteries, the Court in American Broadcasting commented:

[The FCC] unsuccessfully sought to have the Department of Justice take criminal action against them. Likewise, without success, it urged Congress to amend the law to specifically prohibit them. The Commission now seeks to accomplish the same result through agency regulations. In doing so, the Commission has overstepped the boundaries of interpretation and hence has exceeded its rule-making power.

Id. at 296 (emphasis added).

25. Stark v. Wickard, 321 U.S. 288, 309 (1944); cf. Peters v. Hobby, 349 U.S. 331, 345 (1955):

Agencies whether created by statute or Executive Order, must of course be free to give reasonable scope to the terms conferring their authority. But they are not free to ignore plain limitations on that authority.

26. See American Trucking Ass'n v. United States, 344 U.S. 299, 314-5 (1952) (ICC must have reasonable grounds for its judgment; "the rules [must] represent, at best, a compromise between stability and flexibility of industry conditions, each alleged to be in the national interest"); National Broadcasting Co. v. United States, 319 U.S. 190, 219-20 (1943) (standards for FCC's judgment should be "adequately related in their

application to the problems to be solved"); NLRB v. Atlantic Metallic Casket Co., 205 F. 2d 931, 936 (5th Cir. 1953) ("[t]he board is governed strictly by the statute from which it derives its existence"); Colorado Interstate Gas Co. v. FPC 142 F 2d 943, 952 (10th Cir. 1944). See also NLRB v. Highland Park Mfg. co., 341 U.S. 322 (1951).

27. See generally FCC Memorandum on Jurisdiction and Authority, Appendix B, Regulation of CATV Systems, Dkt. No. 15971, 4 P & F RADIO REG. 2D 1707 (1965); Second Report on CATV Regulation, Dkt. No. 14895, 6 P & F RADIO REG. 2D 1717, 1726-7 (1966).
28. In support of a liberal construction of the Act, the Commission cited National Broadcasting Co. v. United States, 319 U.S. 190, 217, 219 (1943), in its Memorandum on Jurisdiction and Authority, supra note 58. "The avowed aim of the Communications Act of 1934 was to secure the maximum benefits of radio to all people of the United States. To what end Congress endowed the Communications Commission with comprehensive powers to promote and realize the vast potentialities of radio." 319 U.S. at 217. "In the context of the developing problems to which it was directed, the Act gave the Commission not niggardly but expansive powers." Id. at 219.
29. See National Broadcasting Co. v. United States, 319 U.S. 190, 216, 219 (1943).
30. There is no doubt that Congress intended by these provisions [§§ 4(i) and 303(r)] to provide the Commission with a degree of flexibility in performing its important tasks. Such provisions, however, by their own terms, are to be measured by the Act and its structure and purpose.

Southwestern Cable Co. v. United States, 378 F. 2d 118, 121 (9th Cir. 1967).

All authority of the Commission need not be found in explicit language.... While the action of the Commission must conform with the terms, policies and purposes of the Act, it may use means which are not in all respects spelled out in detail.

Public Serv. Comm'n v. FPC, 327 F. 2d 893, 897 (D.C. Cir. 1964).

31. Not until petitioners had incurred the expenses of installing necessary fixed facilities and acquiring subscribing customers did the Commission issue the order which, if enforceable, would adversely affect, if not destroy, the petitioners' investments. Southwestern Cable Co. v. United States, 378 F. 2d 118, 124 (9th Cir. 1967) (Ely, J., concurring).
32. Carter Mountain Transmission Corp. v. FCC, 32 F.C.C. 459 (1962), aff'd, 321 F. 2d 359 (D.C. Cir.), cert. denied, 375 U.S. 951 (1963). For a discussion of relevant policy questions, see Note, Community Antenna Televisions: The New Federal Exercise of Jurisdiction, 51 IOWA L. REV. 366 (1966).
33. See Buckeye Cablevision Inc. v. FCC 387 F. 2d 220,225, & n.20 (D.C. Cir. 1967); Philiadelphia T.V. Broadcasting Co. v. FCC, 359 F. 2d 282,284 (D.C. Cir. 1966):

Congress in passing the Communications Act of 1934 could not...anticipate the variety and nature of methods of communications by wire or radio that would come into existence.... In such a situation, the expert agency entrusted with administration of a dynamic industry is entitled latitude in coping with new developments in that industry.

For a further discussion of the FCC and cable television, see Jurisdiction of CATV Service and Channel Service for CATV Systems, in A.B.A. SECTION OF PUBLIC UTILITY LAW, ANNUAL REPORT 175-79 (1967).

34. FCC Second Report on Cable Television, Dkt. No. 14895, 6 P & F RADIO REG. 2D 1727, 1732-33 (1967).
35. Cf. Garkane Power Co. v. Public Serv. Comm'n, 98 Utah 466, 100 P. 2d 571 (1940); Gulf Compress Co. v. Harris, Cortner & Co., 158 Ala. 343, 48 So. 477 (1908).
36. FCC RULES AND REGULATIONS § 43.54: Reports regarding services performed by telegraph carriers.
37. Von Mehren, The Antitrust Laws and Regulated Industries: The Doctrine of Primary Jurisdiction, 67 HARVARD L. REV. 929 (1954).

38. [C]ompetition can assure protection of the public interest only in an industrial setting which is conducive to a free market and can have no place in industries which are monopolies because of public grant, the exigencies of nature, or legislative preference for a particular way of doing business.

Pennsylvania Water & Power Co. v. FPC, 193 F. 2d 230, 234 (D.C. Cir. 1951), aff'd, 343 U.S. 414 (1952). The concept of "natural monopoly" was expanded during the New Deal, and great stress was put on the public policy aspects of federal regulation with the result that many of the industries brought under regulation at that time have remained so, even though the concept itself may have been largely the creation of industrial propagandists. E. HAWLEY, THE NEW DEAL AND THE PROBLEM OF MONOPOLY 2 (1966). See B. BEHLING, COMPETITION AND MONOPOLY IN PUBLIC UTILITY INDUSTRIES (1938); Note, Is Regulation Necessary? California Air Transportation and National Policy, 74 YALE L.J. 1416 (1965).

39. Munn v. Illinois, 94 U.S. 113 (1877).
40. See Schwartz, Legal Restriction of Competition in the Regulated Industries: An Abdication of Judicial Responsibility, 67 HARV. L. REV. 437 (1954).
41. Friedman, Monopoly and the Social Responsibility of Business and Labor, in MONOPOLY POWER AND ECONOMIC PERFORMANCE 109 (E. Mansfield ed. 1964).
42. Address by Bernard R. Strassburg, "The Marriage of Computers and Communications - Some Regulatory Implications," before the Association for Computing Machinery, Washington, D.C. Capter, October 20, 1966, at 3; see M. MASSEL, COMPETITION AND MONOPOLY (1962); G. STOCKING & M. WATKINS, MONOPOLY AND FREE ENTERPRISE (1951).
43. A public utility has been described as a business that is

(1) affected with a public interest, and (2) bears an intimate connection with the processes of transportation and distribution, and (3) is under an obligation to afford its facilities to the public generally, upon demand, at fair and non-discriminatory rates,

and (4) enjoys in a large measure independence and freedom from economic competition brought about by the grant of a franchise from the state placing it in this position.

Davies Warehouse Co. v. Brown, 137 F.2d 201, 227 (Emer. Ct. App. 1943) (emphasis in original), rev'd on other grounds sub nom. Davies Warehouse Co. v. Bowles, 321 U.S. 144 (1944).

44. Terminal Taxicab Co. v. Kutz; 241 U.S. 252 (1916) (public Carriers); Cotting v. Goddard, 183 U.S. 79 (1901) (stockyard); Head v. Amoskeag Mfg. Co., 113 U.S. 9 (1885) (water mill); Spring Valley Water Works v. Schottler, 110 U.S. 347 (1884) (gas and water). The common standard characterizes a public utility as "affected with the public interest," which means "no more than that an industry, for adequate reason, is subject to control for the public good." Nebbia v. New York, 291 U.S. 502, 536 (1933).
45. In re Western Union Telegraph Co., 10 F.C.C. 148, 162, modified, 25 F.C.C. 35 (1958).
46. Communications Act § 3(h), 47 U.S.C. § 153(h) (1964).
47. 47 U.S.C. § 309(a) (1964).
48. FCC v. Sanders Bros. Radio Station, 309 U.S. 470, 474 (1940).
49. 47 U.S.C. § 201(b) (1964).
50. In re Allocation of Frequencies in the Bands Above 890 mc, 18 P & F RADIO REG. 1767, 1788 (1960), quoted in Computer Services, supra note 3, at 335.
51. 47 U.S.C. § 309(a) (1964).
52. Computer Services, supra note 3, at 335.
53. Irwin, supra note 3, at 1313.
54. Id. 1317.
55. Id. 1300-02.
56. Irwin, The Computer Utility, DATAMATION, Nov. 1966, at 26-27.

57. The relationship of moderately high fixed costs and significant variable costs indicates that there is less significant economy of scale in a computer utility as compared with that of public utilities. Actually, the most efficient computer utility in the next few years may be the small, aggressive innovator with a small, hand-picked crew of specialists in a certain market segment.
- C. BARNETT, JR., & ASSOCIATES, THE FUTURE OF THE COMPUTER UTILITY 87 (1967).
58. Allocation of Frequencies in the Bands Above 850 mc., 27 FCC 359 (1959).
59. FCC, In re Application of Microwave Communications Inc., for Construction Permits to Establish new Facilities in the Domestic Public Point to Point Microwave Radio Service at Chicago, Ill.; St. Louis, Mo.; and Intermediate Points. Dkt. No. 10509, Decision, August 14, 1969.
60. FCC, In the Matter of the Use of the Carterphone Device in Message Toll Telephone Service; In the Matter of Thomas F. Carter and Carter Electronics Corp., Dallas, Texas, Complainants v. American Telegraph and Telephone Company, Associated Bell System Companies, Southwester Bell Telephone Co., and General Telephone of the Southwest, Dkt. No. 16942, Dkt. No. 17073, Decision, June 27, 1968.

OPTIONS AVAILABLE FOR SATELLITE TELECONFERENCING SYSTEMS

Despite the efforts to introduce competition in the communications industry, like the MCI and Carter-phone decisions, there are a number of unresolved problems. First, the FCC has been unable to formulate pricing guidelines even though the issue of rate structure and rate levels for individual services is central to the creation of adequate controls in the use of price as a barrier to entry and as a method for cross-subsidization. Second, the FCC has been unsuccessful in developing tools for a benefit-cost analysis of the use of the radio frequency spectrum. Suggestions for rationing the spectrum through the auctioning process may be inappropriate, but nevertheless it still remains for the Commission to establish suitable guidelines. Finally, as stated before, common carrier regulation is still rather cumbersome. Each issue is considered in isolation, and there is little evidence to suggest that unified policies and standards will be forthcoming in the reasonable future.

In proposing a satellite teleconferencing system, the planners will have to be cognizant of the possible responses to the present impasse in the communications

industry. Much has been written in recent years, including a Presidential Task Force,¹ on the ways to reform the public utility-supplier sector of the industry. The opinion diversity extends from suggestions to retain the status quo, with a more rigorous regulation procedure, to proposals advocating the separation of public utilities from their suppliers. Other policy options call for introduction of competitive bidding procedures in the equipment field or the assignation of public utility status to the presently integrated suppliers.

The effects of future policy options on a satellite teleconferencing system are twofold. First, if the system is to incorporate cable and microwave systems, the crucial issue is the liberalization of the interconnection rules and foreign attachment tariffs. Secondly, concerning the satellite system, interconnection policy will be considered, but much more important are the questions of ownership of the system and policies which may introduce competition to the equipment market. There are a number of basic public policy options in regard to the communications industry in general, which will have particular effects upon alternative satellite teleconferencing schemes.

Regulation of the Equipment Suppliers for a
Satellite Teleconferencing System

One policy option would treat the system supply affiliate as a regulated entity. The supplier would be allowed a capital return no larger than the amount permitted to other utilities. This, of course, would call for the submission of the manufacturer's rates, profits, and capital investment to the regulatory agency for review.

There are however a number of difficult problems facing such a policy. Foremost is the lack of experience of public regulation in this area, since manufacturing operations have almost never been treated in this manner. The formulation of a rate-setting policy and its execution would be an enormous additional burden on the FCC's regulatory duties.

The most important factor against such a policy is that the equipment sector does not have the characteristics of a natural monopoly. Although at the present time a duopoly dominates the communications equipment market this is mostly due to the policies of the regulators and the patterns set in the formative period of the communications industry. The market entry requirements, barring utility-supplier pressures, are not extremely forbidding; new products hold the

potential of new and promising services; and the existence of dozens of conventional suppliers earning respectable profits suggest that a 60 per cent market share is not the limit for optimum firm size.²

The European experience with telecommunications also provides evidence that the manufacturing side need not be a publicly regulated market. Although most telephone operations are government-owned and regulated, the equipment market is rather open. In fact proposals have been advanced to increase the competitive nature of the market.³ Thus even the Europeans, who are presently advocating mergers for some sectors of the industry, do not wish a single manufacturing firm in the hardware market.

A Possible Regulatory Regime

A second policy option is to consider adoption of a regulatory regime similar to the present vertically integrated communications industry structure, without a requirement that the system purchase its equipment needs on competitive basis. The main line of reasoning in support of this policy coincides with the common carrier's justifications for retaining their present system.

The advocates of vertical integration contend that the question of over-all system integrity must be

considered at the outset. They state that just as the telephone industry possesses a unique, complex interdependence that makes a systems approach mandatory, so too would this approach be necessary for a satellite system. Systemic integrity involves the need for control over the quality of inputs to the network because the users or operators of one part of a communications grid can, by supplying it with improper or distorted signals, interfere with users throughout the entire system. Likewise the planning aspects of the systems approach, which avoid wasteful redundancy and degrading performance through coordination, are considered as positive aspects.

Considering the complexity of the existing telephone system and the need for interdependence, the systems approach has appeal in the satellite area. However, these factors are not unique to the communications industry. The aerospace industry and computer service industries have developed sufficiently without the systems approach. Further, it could be argued that the basic problem of the communications industry is not due to the failure of the systems approach, but rather is due to the restrictions imposed by vertical integration.

A further argument for a regulated approach to satellite teleconferencing systems has to do with economies of scale. In the communications industry, cost comparisons between Western Electric and independent equipment suppliers are offered as evidence of the superior efficiency of the integrated supplier. The superior performance of Western, it is argued, is due to economies of scale, intensive cost reduction programs, and Western's quantity buying practices. However, some critics are unwilling to accept the above reasoning as a justification for vertical integration.

First, the concept of economies of scale is plant oriented, and is not necessarily applicable to a firm which manufactures in many geographic locations. Second, in order to take advantage of economies of scale the manufacturer need not have a permanent link with a utility. Third, the economies of scale may cause losses in the production areas where specialization is important; that is, where size does not allow a more particularized type of manufacturing. It is probable that the competitive market is the proper vehicle to test and balance the production function between scale and specialization in the satellite teleconferencing system area.

An additional argument is that the maintenance, repair and quality of communications equipment is best secured within the confines of a single organization embracing service and manufacturing. However, the development of independent repair services might create more market efficiency and greater competition amongst firms to the benefit of the user. Given the mix of communication services in a satellite teleconferencing system it is most likely that a competitive arrangement would prove most satisfactory.

The third policy alternative in a satellite teleconferencing system calls for acceptance of vertical integration with the inclusion of competitive bid procedures in equipment contracting. Thus the system would keep an interest in the manufacturing area, but would be required to solicit competitive bids from all equipment suppliers in the field. This solution accepts the supposed advantages of integration and also attempts to realize the gains expected from a competitive market.

This policy option presents several problems. The first problem is that regardless of the bidding procedure, the independent suppliers may not have the ability to immediately compete with an integrated supplier. Public subsidies to aspiring competitors would most likely not produce the desired result of minimizing cost for the public.

A second problem concerns the difficulty in formulating an equitable competitive bidding procedure. It is very important to select a bid procedure which will allow the system managers the least amount of discretion, since otherwise the bidding requirement will become a rubber stamp. Generally, the bidding procedure sets forth a number of criteria, involving cost and other factors.

A third problem of adopting competitive bidding to the status quo centers on the allocation of research and development. It would appear to be easier to share these costs if there were an arrangement between the system manager and the equipment supplier, and yet this situation would not foster competition. If an arrangement did exist, all contracts requiring innovative efforts would be awarded to the supplier having the cooperative agreement. The efficiency of the other suppliers would not be adequately rewarded.⁴

In any satellite teleconferencing system, the overriding public policy should be directed towards providing for the optimum research and development which would result in system improvement. This process of innovation will most likely be advanced by a system that provides for competition amongst various firms. The one area where this will not be true is in the

educational teleconferencing satellite system where the users will probably not be in a position to pay adequately for the service. Thus there will be no great amount of competition for these services. Generally, however, it has been the activities of independent firms that have aided in technological development in the communications field. The development of microwave systems indicates that the major innovative work is done under the pressure of competition. Further, in satellite development, the 1959 proposals of the Bell system for a global satellite network using random orbit satellites would have required extremely large capital expenditures which would have precluded most firms from the field. However, the synchronous satellite has developed to the point where we are now considering dedicated teleconferencing satellite systems for domestic use.⁵ Thus it is possible that nonintegrated hardware firms may indeed assume sponsorship of dedicated satellite teleconferencing satellites in the commercial area while the federal government may assume sponsorship of educational teleconferencing satellites.

FOOTNOTES

1. Final Report, President's Task Force on Communication Policy, December 7, 1968.
2. M. Irwin, The Telecommunications Industry 151 (1971)
3. See Christopher Layton, European Advanced Technology, PEP, 1969. Also see Layton's address to the conference on "European Technology Collaboration," London, 16-IX-1969.
4. See generally, Irwin, supra note 2 at 150-9. It is arguable that a utility and its integrated supplier could be separated through the use of antitrust laws. The FCC could use its statutory authority to achieve this objective. Section 7 of the Clayton Act [15 U.S.C. § 18 (1964)], which controls horizontal and vertical mergers, if they are restrictive, would be the main weapon. Section 11 also expressly provides that the FCC may enforce its antitrust powers by ordering divestiture. However, the Commission has never attempted to use its antitrust enforcement power, thus the scope of its authority has not yet been determined. If antitrust were to be applied to Western Electric a number of major issues emerge. They center on retroactive use of the Clayton Act, the effect of the 1956 Consent degree, and the FCC's power to regulate vertical mergers.

The first issue is whether the Clayton Act can be applied retroactively to cover the 1881 acquisition of Western Electric by AT&T. In *Pan American World Airways v. The United States*, 371 U.S. 296 (1963), the court ruled that it will allow retroactive application of antitrust legislation (in this case, the Sherman Act) if there has been an acquisition and at the time of the suit there is a reasonable probability that the restraints will occur. Although the case involved the Sherman Act, the Court based a part of its decision on an earlier case which was concerned with the Clayton Act, but did not contain the element of retroactivity [*U.S. v. Du Pont de Nemours* 353 U.S. 586 (1957)], and thus the Court was forced to settle that question.

The semi-legalizing effect of the 1956 Consent Decree does not really bar FCC action. The 1956 suit was filed under the Sherman Act (under which the FCC has no authority), while a new action would come under the Clayton Act. The latter legislation is devised to reach situations which have not ripened into Sherman Act actions. Finally since the decree was entered without adjudication, there is a question whether it carries any judicial approval.

In the arc of horizontal mergers the FCC has power under Section 221 of the Communications Act [47 U.S.C. §221 (1964)] to approve a merger of any two telephone companies. This section was interpreted in *Seaboard Air Line R.R. v. United States*, 382, U.S. 154 (1965) to give the merging firms exemption from antitrust laws. However, the parties need not seek approval, since the application of the section is not mandatory.

Section 214 of the Communications Act [47 U.S.C. §214(a) (1964)] also pertains to horizontal mergers. It calls for FCC approval for any acquisition of a "line" by a carrier. A "line" is any channel of communication established by the use of appropriate equipment, other than a channel of communication established by the interconnection of two or more existing channels. The section is inoperative if the merger obtains approval under section 221. It is really a residual clause to cover any mergers not taken up by other sections, and since the criteria is based on public convenience and necessity, application of the Clayton Act is not suspended. Furthermore, if the FCC does not enforce the Clayton Act, the Department of Justice is still free to do so in any section 214 merger. Although the horizontal mergers should be closely scrutinized, they are not as restrictive as the vertical mergers. In addition, the products of horizontal mergers are still to be publicly regulated, while vertical mergers are more difficult to control.

The FCC has broad powers under the Clayton Act which can also be applied to vertical mergers. Particularly section 7 of the Act would pertain to the vertical integration scene since it is applicable to any corporation engaged "in commerce."

Also section 2 of the Robinson-Patman Act [15 U.S.C. §13(a) (1964)] prohibits discriminatory pricing practices and controls customer-supplier relationships. Although many of the pricing policies by the carriers are subject to public regulation, some areas remain beyond the FCC non-antitrust authority (such as carrier-leasing from other carriers). Section 3 of the Robinson-Patman Act dealing with tying agreements and exclusive dealing arrangements directly concern the vertical relationships. Thus by combining section 7 of the Clayton Act and sections 2 and 3 of the Robinson-Patman Act the FCC should be able to reach and control the gamut of various vertical relationships.

Having the tools of antitrust legislation does not mean that the FCC is prepared to use them. A major suit such as a divestiture action against AT&T, or even an attempt to regulate other restrictive practices between AT&T and Western Electric, is also an important political decision. It is doubtful at the present time that the administration would involve the Department of Justice or the FCC in actions which involve major restructuring consequences on the communications industry.

5. Further, the MCI decision will encourage further research and development in this area, and the field of computer switching and data modems will respond positively to the carterphone case.

ALTERNATIVES FOR THE REGULATION AND CONTROL OF
A SATELLITE TELECONFERENCING SYSTEM

Assuming a mix of technologies involving the satellite, CATV, microwave, and possibly telephone lines, there are a number of policy alternatives which would to various degrees encourage the growth of the capabilities necessary to establish the system. There are a number of different levels on which the problem can be considered.

Program Content Control

One source of concern is with the content of the material presented over such a satellite system. The First Amendment rights to freedom of speech and freedom of the press would appear to preclude regulation of the content transmitted by such a system. If one considered the goals of such a system to be to encourage diversity of content and freedom of access then it would not be desirable to establish content regulation which, in fact, would be a form of prior restraint. The control of program content is probably not a major problem, and, in any event, in the extreme cases there are sanctions that can be applied to discourage blatant mis-use of the system.

To the extent that programs of an interactive nature are coded and not made available to the general public or even to a single class of users, it might be argued that the regulatory regime of essentially no content control applicable to telephone conversations should apply. On the other hand, when a program is presented in such a way as it approximates a broadcast, then certain rules and regulations would be enforced.

The Desirability of Federal Regulation

The Availability of Circuits

The amount of regulation may also be altered by the ease of access to the system. For example, if only a limited number of satellite circuits are available then justification of the FCC for regulation of broadcasting applies since this is the utilization of a scarce resource. Alternatively, if there are an unlimited number of circuits, then the rationale for regulation based on the "scarce resource" theory loses some impact. The fact that some form of regulation may be desirable even if there are an unlimited number of frequencies would probably merit considerable debate. Even with unlimited channel capacity, it is not necessarily true that everyone will have access to the capital required to produce alternative programming if there was disagreement with what was being presented.

One option for a regulatory regime would be to give the FCC complete control over the satellite teleconferencing system. The FCC could then be empowered to establish regulations which would encourage utilization of the system and also provide for access to the system by educational and other public interest groups.

The basic issue here is whether FCC regulation in a general sense is desirable if the system provides for unlimited channels as opposed to broadcasting at the present time on a limited number of frequencies. The use of the existing radio spectrum today is dependent on its physical dimensions.¹ The first being the frequency bandwidth needed to transmit bits of information. There has been a perennial concern of frequency scarcity, mainly due to technical restraints which limit more extensive use. The other two spectral dimensions are time and space: time being the period within which transmission is made, and space the area through which the radio signals must pass. The degree to which the latter dimension is occupied depends on the intensity of radiated power. In extreme cases, power intensity will so saturate a volume of space that it obliterates any competing signal.²

The great present increase in the need for communication service, as well as forecasts for the future,³ will call for further technical developments, both of extensive and intensive type, in the communications industry. Extensive development refers to the broadening of the radio spectrum through the ability of manufacturers of communications equipment to produce instruments capable of transmitting communications at higher and higher frequencies. It will be the role of both private and government sectors to encourage and finance the research and development and innovation efforts in this area.

Technical advances of an intensive nature occur through the development of each dimension of the spectrum. The spatial dimension will be broadened with the improvements in transmitters and directional antennas (for microwave relay). This allows closer geographic spacing of users, especially in the microwave field where sensitive antennas will be capable of receiving less powerful signals. The frequency dimension may be improved with better equipment allowing bandwidth splitting while at the same time limiting wasteful side-emissions. Finally the time dimension could be improved through more cooperation and planning as well as parallel technical advances in the frequencies techniques.⁴

On the other hand, it should be considered that the availability of improved equipment does not on its face imply a more efficient use of the spectrum. Much depends on the cost of the hardware and the degree to which its capability is utilized. If optimum spectrum economy, in a technical sense, is realized through higher-cost equipment, such economy is not necessarily optimally efficient in an economic sense. Technical efficiency must be pursued with the aim of reducing eventual hardware costs while utilizing more of the radio spectrum.

In the efforts to improve the utilization of the radio spectrum, the substitutes for the spectrum may provide a workable solution. Substitutes for broadcasting include the use of open wire, coaxial cable and CATV. There is also the possibility of future development of the laser and circular wave guide tube as communication techniques. In regard to the direction of substitution it would seem that the several modes should supplement each other and each should find an appropriate role in the communications industry. The process by which appropriate functions for each technique are selected is a key factor in the development of a satellite teleconferencing system.

Economic Factors

Generally the natural resources, above and below the earth's surface, which are available to mankind's utilization are characterized as possessing either stock or flow attributes.⁵ Stock resources, like minerals, oil and natural gas are regarded as inventories or stocks that await processing. The inventory-type resources are irreplaceable, finite, and require further processing. Meanwhile flow resources, like arable land, fisheries, or water flow are potentially replaceable, restorable, or augmentable - at a price in renewed investment to sustain productivity. Unwise decisions in the management of resources area by owners-users may lead to early exhaustion of stock resources or obliteration of flow resources.

In both cases, the owner-user makes crucial decisions whether to invest in hopes of discovering new reserves of a stock resource, or to rectify the depletion of a flow resource. Because such investment is not without cost, users must weigh expected costs against expected yields. Within this context, the radio spectrum possesses a definable magnitude which, although somewhat arbitrarily determined, gives it stock attributes. The more it is occupied or utilized, the less remains to occupy or utilize.

However, unlike stock resources, the radio spectrum's usable portions at the present time depend on technology, economics, and regulatory administration. The scarcity and congestion of the spectrum are not regulated through a market and price system, as it is in the case of stock resources. Without such markets and prices, spectrum managers and owner-users have accommodated scarcity through a system of central allocation and deliberate efforts to extend the spectrum, both intensively and extensively, as well as to develop substitutes for radio communication.

Like flow resources, the spectrum is also subject to degradation through pollution or congestion. Pollution may be due to non-communication use of radio, adjacent channel interference, or even general congestion by communications. But unlike other flow resources, as soon as the sources of degradation are removed the spectrum returns at once to its original state. Ordinary flow resources are restored through considerable investment and effort, and after a period of time. In the spectrum, the sources of pollution may not be easy to eliminate on short notice, once hardware investments are made, nevertheless a public allocation decision, when enforced, could bring a restoration of that part of the spectrum. Therefore,

the difference between spectrum and other flow resource allocation as concerns the cost of restoration may in fact only be one of degree.

As has been pointed out in the previous paragraphs the decisions regarding the restoration and fuller utilization of the radio spectrum resource have not been based on market and price considerations, although they are not totally neglected, but on criteria formulated by a public allocation agency. The reason for this situation is that the radio spectrum, as presently constituted, has many attributes of a common property resource, and represents a vital depository of public value.

The question may be asked as to why property rights do not exist in the radio spectrum and as a consequence no national market has emerged. It is important to consider this issue in any discussion of the "inherent" common property attributes of the radio spectrum, since it may lead to the development of an alternative regulatory regime for satellite teleconferencing systems.

Without a system of regulation, users of a common property resource would lack incentives to refrain from use rates which raise costs against themselves and others. That is, unless assured that other users

will also refrain from using up the resource before they do, no initial users have reason to postpone or reduce their own use. Since everyone would consider the resource to be free there is bound to be excessive use of labor and capital. But eventually this would cause tendencies toward depletion of the resource and economic inefficiency generating attempts to appropriate rights unilaterally, or by agreement of the users. Even more frequently, there will be a call for public control of output and/or entry.⁶

The radio spectrum, although nondepletable even when used, is prone to economic inefficiency and congestion in the absence of public regulation or a system of private property rights. No spectrum user will reduce his power or service range to avoid another's frequency space unless certain that a rival will not simply raise his power in turn, at the original user's, and public's expense. Similarly no user will invest in techniques to reduce the amount of spectrum he needs unless he is sure he can benefit from the space thereby released, and not merely have it pre-empted by another.

The United States, in what was considered an absence of clearly defined private radiation rights, opted for public regulation of the radio spectrum. The two main reasons why property rights do not exist

in the radio spectrum resource are that the cost of appropriating and defending exclusive use rights is too high, and that national traditions militated against such rights from the outset. Even today with advances in the technical possibilities of defining use rights, and the sale of renewable licenses, there seems little likelihood that private property rights in the spectrum will ever be tolerated.

It has been argued persuasively that the courts were on their way to establishing property rights in the radio spectrum when Congress intervened in 1927.⁷ Once property rights had been defined the basis would have been laid for market transactions, and a viable competitive system might have been established. Interference control could have been conducted through tort law or on initial definition of rights via administrative channels. Thus consumers would be left free to choose between signals of varying clarity, and broadcasters free to bid for spectrum against the government or other nongovernment users. By seeking to curb interference more rapidly than otherwise, on grounds of safety and defense, the Congress has created an apparatus of public regulation. By doing this the Congress accepted arguments that the judicial process would be too slow and cumbersome, the market transactions

too complex and costly, and that property rights in the spectrum would subvert overriding national policies.

Today, whatever the viability of the present public allocation system, certain presumptions constitute a real barrier to any market allocation of the radio spectrum. These presumptions include the apprehension that freely transferable spectrum rights, or even public auctions of renewable rights would price the small operator out of the market and cause a concentration of broadcast facilities in large urban centers; deter new capital by raising the cost of entry; give broadcast licensees equitable protection of their earning power and undermine the FCC's power to impose more comprehensive requirements for public service; and burden the licensee with additional costs and induce him to cut back public services. Such presumptions have a considerable political appeal, through fear of monopoly and subversion of equal access by a wide variety of political, economic and social groups; and of impeding prompt access to the spectrum by government in wartime, and substantial access in peacetime. Thus, the spectrum today can be properly considered a common property resource which necessitates public allocation and subsequent regulation.

In addition to the politically-based presumptions described above, another important consideration which calls for public control of the spectrum is its overriding public value. The spectrum is used for a variety of social, political, safety, educational, cultural, informational, and military purposes. The unique potential of communications in the area of education and information would probably not be properly utilized through market allocation of the spectrum.⁸ In order to further the public value potential, the control of the spectrum should thus remain in the hands of a federal allocation agency. The fostering of satellite teleconferencing systems could therefore depend on reforms of the present system, or switch to a market-oriented system. If a limited number of frequencies were available, or if access costs were extremely high, then federal regulation and perhaps even system ownership would be desirable. However, if unlimited frequencies were available and educational and public access were reasonable, then private ownership and policy-making might be satisfactory.

Frequency Allocation and Management Without Markets:
The FCC

The FCC, which is entrusted with regulatory and allocational tasks in the nongovernmental sector⁹ grants

licenses to prospective broadcasters, assigning specific frequencies for their use with the provision that "public convenience, interest, or necessity be served thereby."¹⁰ This type of a regulatory regime occurred due to the growing awareness of the radio's importance together with a recognition of the radio spectrum's limitation to accommodate all possible users. With the adoption of a system of central allocation, the system of prices and markets was completely disregarded. However, the compelling need to do what prices would otherwise do has left an imprint on the allocational framework. The licensing function provides the integrating system which prices would otherwise provide in the market. The FCC's provision of a price equivalent by no means implies that their allocational criteria are necessarily market criteria. On the contrary, the FCC has often overridden market criteria with social priorities in conducting both its licensing and its allocational function.

The FCC's task is to define, delimit and distribute use rights among the competing services and therein among competing users. Its licensing function is geared to alter business conduct, while the allocation function is intended to alter the structure of the communications industry. In evaluating competing

claims between alternative services and prospective licensees, the FCC gives special weight to factors which at first glance would appear to be market oriented.

The following criteria are frequently emphasized:

1. The inability to use wire as a viable substitute for radio;
2. The ability of the licensee to render the best practicable service to the community;
3. Evidence that any new service would in fact be publicly accepted and the scarce frequencies thereby not lie idle;
4. The relative suitability of different parts of the spectrum for different types of service;
5. Technological factors - the relative cost and feasibility of converting equipment and receivers for operation of different frequencies and the time needed for orderly change.

Such factors at first resemble market criteria.

Upon closer scrutiny, however, the criteria are not found to be approximations of market forces. Regulatory agencies can not apply the above factors in the same way that interacting buyers and sellers could in a free market.

In a free market, users would want to purchase circuits most suitable for their needs. Users through trial and error would gradually come to occupy those frequencies technically and economically most suitable to their needs. The question is whether a regulatory

agency can produce such a pattern more quickly and with less economic waste. A key problem is that under direct allocation the needed changes accumulate and must be made all at once. Whereas a market system, in theory, can facilitate the same changes more gradually, over a longer period of time.

Users, in a free market would want to buy circuits that they expected to be able to use soon. The duration of time before the assigned circuits are activated may vary in the two cases. Without market pressure regulatory agencies may tolerate stock-piling for longer periods than seems economically or socially desirable. Market incentives, on the other hand, might encourage circuit allocation with a minimum of time delay.

The users best able to bid for circuits in a market system might be those most responsive to the needs of public, but they might also be solely concerned with economic gain. The number of people who benefit from any service may in fact exceed the number who would be willing and, even, able to pay for it. This would present a situation where social benefits would need to be balanced against private benefits, and where public subsidies might be needed and justified.

Thus the social priorities force the criteria far away from market considerations.

If circuit prices were high, reflecting relative scarcities, one would expect to find those users who could substitute other transmission means to do so. In a free market, users could weigh the relative cost and benefits of various alternatives and achieve some optimal combination in their production arrangements. However, it is unlikely that user groups could always be counted on to be able to obtain cost effective alternatives, and thus the question arises of whether subsidies should be available to ensure educational and public interest access.

FOOTNOTES

1. Electromagnetic radiation is radiant energy resulting from acceleration of an electron or other charged particles. Forms of electromagnetic radiation are light, radio waves, x-rays, heat radiation, ultraviolet radiation, and gamma rays. Electromagnetic energy travels from its source in wave form. The electromagnetic waves possess different wavelengths and frequencies, the frequency and wavelength being inversely proportionate. The measure of wavelength is based on the progression of a wave from one peak to the next, which completes one cycle of the wave. The rapidity with which a wave completes one cycle is the frequency, expressed in cycles per second. The term hertz, which is synonymous with "cycles per second," has recently come into use. The electromagnetic spectrum is so vast that it is helpful to use the terms kilohertz (KHz), which means 1,000 cycles per second; megahertz (MHz), 1,000 kilohertz; gigahertz (GHz), 1,000 megahertz; and terrahertz (THz), 1,000 gigahertz. At the present time the portion of the electromagnetic spectrum used for over-the-air radio and television broadcasting is very small. The radio spectrum ranges from ten kilohertz to three terrahertz, thus defining the magnitude of the resource base.
2. Gifford, Maximizing Our Radio Resource, An Address Before the Group on Electromagnetic Compatibility, Washington D.C. Section, Institute of Electrical and Electronics Engineers, May 12, 1966, at 6. The Telecommunication Science Advisory Panel of the Commerce Technical Advisory Board stated:

The Joint Technical Advisory Committee has identified present dimensioning of spectrum utilization as completely inadequate for really effective analytical efforts towards frequency sharing. Dimensioning is primarily in terms of frequency, and that provides only a small segment of the total picture. Usually, only an inference of the geographical space utilized is obtainable from the power, antennas, and geographical data supplied.

This conception of spectral dimensions will help in deciding how close to each other users may come in regard to any of the three dimensions before the resulting interference becomes intolerable. The major criteria to be considered in making the decision is the character of information being transmitted and the state of the arts. In the past, technical advances have facilitated closer spacing in all three dimensions without hindering effective communication, and at the same time extended, to a limited degree, the range of usable frequencies and the areas over which they are usable.

The spectral volume which any user requires to transmit information, with some degree of reliability and clarity can be eliminated in terms of the frequency, the three-dimensional physical space and time period of operation, and the power used to radiate transmissions considered adequate to overcome competing noise. It has been suggested that in order to maximize the radio resource, there ought to be devised "...a standard unit of spectrum utilization based on a specified level of radiated energy density over a specified bandwidth over a specified geographic area." In this manner each spectral physical dimension would be fully utilized and considered during the decision-making process of spectrum allocation. U.S. Commerce Technical Advisory Board Telecommunications Science Panel, *Electromagnetic Spectrum Utilization - The Silent Crisis* 3 (1966), at 33.

3. See R.L. Barrow and D.J. Manelli, "Communications Technology - A Forecast of Change" (Part I), 34 Law and Contemporary Problems 203 (1969).
4. See M.J. Levin, "The Radio Spectrum Resource," 11 The Journal of Law and Economics 433, at p445, ff 8. Levin states, "At present we could conceivably transmit three conversations on the same frequency with time division multiplex, but would have to modulate so fast as to require more than three frequencies presently needed to do the same with 'frequency division multiplex.' Should we become able to transmit the conversations on the same frequency with no change in modulation, greater exploitation of the temporal dimension will become technically possible.

5. For a standard characterization, see Anthony Scott, Natural Resources: The Economics of Conservation (1955).
6. Ibid.
7. R.M. Coase, "The Federal Communications Commission," 2 Journal of Law and Economics 1, at 25-35 (1959).
8. The response of larger communications concerns to public needs in this area has not been great. See Nicholas Johnson, "Towers of Babel: The Chaos in Radio Spectrum Utilization and Allocation," 34 Law and Contemporary Problems 505, at 524-5. FCC Commissioner Johnson considers the market allocation "no more than an academic suggestion, given the political realities," at 525.
9. 47 U.S.C.A. § 307.
10. Ibid.

AN EDUCATIONAL SATELLITE TELECONFERENCING SYSTEM

System Components

Any discussion of the alternatives for an educational satellite teleconferencing system bears in some part on the users that are being contemplated for the system. If the users are primarily in the governmental sector then one type of system will be developed. If the users are in the educational community then other standards and funding problems arise, and concomitantly other regulatory problems. Finally, if the users are both from the educational community and the private sector some proportional sources of funding and regulation will need to be formulated. Thus the ownership and management alternatives may depend primarily on the categories of users that are identified.

There has been some discussion recently over whether the educational community should receive special treatment from communication suppliers because of the nature of their activities. The basic argument is that since the nation has a commitment to education that electronic teaching from a distance and the other uses that could be made of a satellite teleconferencing system should in effect be subsidized by the federal government or that reduced tariffs should be negotiated with the carriers. If one takes this argument to its logical conclusion, it would appear logical to provide for a unique regulatory regime for a satellite teleconferencing system which

devoted to educational purposes and other public service activities. The following is an analysis of these arguments.

The Satellite

A major component of a satellite teleconferencing system will be the satellite itself. Here there are two alternatives for implementation of the system. Either the teleconferencing will make use of circuits available on the commercial domestic satellites or the operators of the system will arrange for circuits on a dedicated satellite launched for primarily teleconferencing and related activities.

Concerning the availability of circuits on the domestic commercial satellites, it is not clear at this point whether there will be a number of such systems or only one. President Nixon's Task Force has rejected the natural monopoly argument when applied to domestic satellite development and has suggested that any firm should be permitted to establish either a general or specific domestic satellite system and that the ownership could be either private or public.¹ Further, Clay Whitehead of the Office of Telecommunication Policy has indicated that the AT&T - Comsat proposal for a domestic satellite system could create antitrust problems since two suppliers of communications have joined to provide satellite services. Whitehead indicated that the problem could be avoided if a public message system rather than a private one were provided.

A number of questions arise here which must be resolved by the FCC. One issue is whether the procurement rules of the Communication Satellite Act will apply to Comsat or any other domestic satellite owner or whether competitive buying procedures will apply to private satellite systems. It is also possible that the authorized user question will be reconsidered within the context of domestic satellite operation.²

Assuming a public service/educational basis for a satellite teleconferencing system, it is possible that special arrangements will be made by domestic satellite operators to provide for such a system.

The Federal Communications Commission on March 24, 1970 clearly recognized that the needs of educational institutions should be served by parties applying for domestic satellite systems and it is arguable that the utilization of a satellite teleconferencing system is one of these needs. It is the Commission's belief that these needs should be served through terms and conditions which are in the public's best interest and which will provide the greatest "peoples dividend". These benefits to the public can probably best be derived by providing education with tariffs for communication services of a special nature, as opposed to applying standard commercial tariffs to situations where the public stands to benefit.

The FCC's Report and Order Concerning the Matter of Establishment of Domestic Communication-Satellite

Facilities by Nongovernmental Entities, Sec. 34, provides an insight as to what the Commission feels the nature of these special terms and conditions should be. That Report and Order of March 24, 1970 states--

Sec. 34 "All applicants should further address question ...(b)..."

(b)(1) Where the proposed services include television or radio program transmission, the terms and conditions under which satellite channels will be made available for non-commercial educational networks. We note that parties to this proceeding, such as COMSAT and the ABC network, have proposed to provide satellite channels without charge for the interconnection of public and instructional broadcasting. We believe this to be in the public interest. Applicants proposing television or radio program transmission services should also address the possibility of realizing a "peoples' dividend" to provide some funds for programming by noncommercial educational stations, as suggested by the Ford Foundation.

(2) Applicants proposing multi-purpose or specialized systems should also discuss the terms and conditions under which satellite services will be made available for data and computer usage in meeting the instructional, educational, and administrative requirements of educational institutions.

The FCC has recognized the potential of domestic communications satellites to assist education, and the result has manifest itself in the various proposals submitted by companies applying for the right

to construct domestic satellite systems. The majority of these proposals clearly place education in a special category enabling it to derive certain benefits not applicable to commercial interests. An example of these benefits is shown in one of the more inclusive proposals by MCI Lockheed:

For five years after the start of domestic satellite operation by MCI Lockheed Corporation the company will make available transmission capacity equivalent to five television channels for educational use in the United States without charge. MCI Lockheed believes that this offer of earth station to earth station service is the best way to encourage experimentation and innovation on the part of educators.

For the remainder of the satellite's operating life, similar transmission capacity will be offered at a fraction of regularly established rates.

By assuring a continuation of the same type of communications at a nominal rate, orderly expansion of instruction techniques and programmed administrative uses will directly benefit students of all ages.

The MCI Lockheed proposal is an example of what can be provided for the educational community. There are approximately thirteen other proposals before the FCC, most of which make some special provision for the educational communication. The advent of satellite teleconferencing brings with it new possibilities for economical educational developments that were previously financially impossible considering common carrier standard transmission rates.

The FCC in 1) calling for special considerations for education and 2) calling for multiple applications for domestic systems has shown its concern over past practices and policies in the area of long distance transmissions. The future may very possibly bring increased competition into the communications field: Competition which is willing to provide special terms for educational institutions. In the future, common carriers may indeed find it advantageous to provide separate tariffs for educational satellite teleconferencing. Regardless of the implications, it is evident in both the report and order and in the reactions by the majority of the companies submitting applications that the future holds new promise for the public and its educational institutions in the field of teleconferencing.

Cable Television

Another of the components of a satellite teleconferencing system will be cable communications. Under certain demographic situations, CATV will provide the most economical means of transmission for signals. At the present time, the regulatory regime concerning cable communications is uncertain. The FCC has issued a Letter of Intent concerning rules for cable television regulation.³ The Office of Telecommunication Policy

is conducting a long-range policy study concerning cable regulation including a section on the question of educational access.⁴ Depending on the outcome of the FCC's Letter of Intent, cable regulation of some type will probably be promulgated by spring of 1972. Given the desirability of connecting CATV to a satellite teleconferencing system, it will remain to analyze these new rules to determine the effect of FCC regulation on the overall development of a teleconferencing system.

In their letter of proposed CATV rulemaking of August 5, 1971 the FCC states

Broadcast signals are being used as a crucial component in the establishment of cable systems, and it therefore seems appropriate that certain basic goals of the Communications Act be furthered by cable's advent - the opening up of new outlets for local expression, the promotion of added diversity in television programming, the advancement of educational and instructional television, and the increased information services of local governments. Accordingly, we will require that there be one free, dedicated, non-broadcast, public access channel available at all times on a non-discriminatory basis. In addition, we will require that one channel be set aside for educational use and one channel for state and local use on a developmental basis and that, upon completion of the basic trunk line, for the first five years thereafter these channels will be made available free.

The FCC, just as in the case with domestic satellite systems, has recognized the need for economical

educational communications and has accordingly prescribed special conditions pertaining to rates charged to educational institutions. These conditions would obviously apply to a satellite teleconferencing system.

Elsewhere on the national level, a special case is made for cable rates charged to education by groups such as the National Cable Television Association, the Joint Council on Educational Telecommunications, the National Education Association and many other groups.

On the state level, Wisconsin's Educational Communications Board has adopted a resolution calling for the reservation of 20% of all cable systems' capacity for instructional and in-school use, along with free cable connection and service to all elementary, secondary, and post-secondary schools.

Both on the federal and state level cable television has proven to be one of the many areas in the field of communications in which the need and the value of efficient educational services has been recognized. If education is to develop to its fullest possible limits, it should not be expected to compete for services on an equal basis and rate schedule with existing commercial interests. Cable television, which is still in its infancy, shows promise (due

greatly to the efforts of educational groups) that it will categorize its areas of service and structure its rates accordingly.⁵ This type of structuring will best serve the general public and the educational community, and will provide for the optimum development of a teleconferencing system.

Instructional Television Fixed Service (ITFS)

A final transmission means that can be interconnected to a satellite teleconferencing system is an ITFS service. On July 25, 1963, the FCC allocated 31 channels in the 2500-2690 MgH range to be used solely for educational purposes.⁶ Designated as Instructional Television Fixed Service (ITFS), this allocation allows educational institutions to transmit verbal and aural programming to receiving stations within a radius up to 20 miles from the originating transmitter. These ITFS signals cannot be picked up on home television sets since receiving stations require a special antenna and down-converter. In June 1969, the FCC also specifically designated 2686 to 2690 MgH for audience feedback (via FM radio) to ITFS stations.⁷

As defined by Section 74.901 of the FCC Rules and Regulations, an ITFS station is:

A fixed station operated by an educational organization and used primarily for the transmission of visual and aural instructional, cultural, and other types of educational material to one or more fixed receiving locations.

The FCC established the ITFS service primarily to aid in school education, as Section 74.931 of the FCC

Rules and Regulations states:

Instructional television fixed stations are intended primarily to provide a means for the transmission of instructional and cultural material in visual form with an associated aural channel to specified receiving locations for the primary purpose of providing a formal education and cultural development to students enrolled in accredited public and private schools, colleges, and universities.

However, the FCC recognized that in-service training and administrative conferences pertaining to education were also worthy of special consideration, for the Commission stated that ITFS could be utilized for these purposes as well as in-school training. Section 74.931 declares:

(b) Such stations may also be used for the additional purpose of transmitting visual and aural material to selected receiving locations for in-service training and instruction in special skills and safety programs, extension of professional training, informing persons and groups engaged in professional and technical activities of current developments in their particular fields, and other similar endeavors.

(c) During periods when the circuits provided by these stations are not being used for the transmission of instructional and cultural material, they may be used for the transmission of material directly related to the administrative activities of the licensee, such as the holding of conferences with personnel, distribution of reports and assignments, exchange of data and statistics, and other similar uses. But stations will not be licensed in this service solely for the transmission of administrative traffic.

ITFS licensing requirements further disclose the FCC's conscious effort to strictly limit ITFS allocations to educational organizations. Section 74.932 declares:

(a) A license for an instructional television fixed station will be issued only to an institutional or governmental organization engaged in the formal education of enrolled students or to a nonprofit organization formed for the purpose of providing instructional television material to such institutional or governmental organizations, and which is otherwise qualified under statutory provisions of the Communications Act of 1934, as amended.

Granted that the FCC established ITFS in order to aid education, the question arises as to how ITFS will actually achieve this purpose. The FCC's Committee for the Full Development of the Instructional Television Fixed Service answered this question by declaring, "An ITFS system should play a major role in increasing the effectiveness of student learning and in providing learning resources not otherwise available."⁸ More specifically, this Committee

noted that ITFS helps solve educators' need to find a more economical and efficient means of distributing high quality learning materials to classrooms!"⁹ Additionally, several other characteristics unique to ITFS can greatly aid the educational process:

- (1) ITFS is especially adaptable for local school use.
- (2) ITFS is flexible because it provides a multichannel system that enables the administrator to cope more effectively with traditional scheduling problems which, up to now, have plagued instructional TV.
- (3) Programs may be repeated whenever required, and up to four different programs may be transmitted simultaneously.
- (4) ITFS is relatively economical to use.
- (5) When combined with other methods of TV transmission, it can provide electronic flexibility and capability heretofore unavailable.¹⁰

The above characteristics are factors which influenced the FCC's decision to award educational interests exclusive use of ITFS, and they apply with equal force and validity to the development of a satellite teleconferencing system utilizing ITFS interconnection.

Despite the strengths of ITFS, the FCC's ITFS Committee is also cognizant of ITFS's limitations, especially: "...the inability of ITFS, under present technology and rules, to reach the public outside of the classroom, thereby precluding nonclassroom preschool,

and other special uses."¹² In fact, the ITFS Committee acknowledges the role which media other than ITFS can play in the educational process, when it states: "An ITFS system operates best in a communications system approach, as part of the coordinated use of all available educational communications media."¹² Again, this supports the development of a satellite teleconferencing educational system.

Educational interests have received preferential treatment concerning ITFS largely because ITFS possesses various characteristics beneficial to the educational process. Yet other media, including the telephone, also possess unique characteristics which could greatly enhance the educational process. Because of the value placed on education in the United States, it could be argued that all of the components of a satellite teleconferencing system should receive negotiated tariffs.

It is also important not to overlook the ITFS Committee's great concern with the economic advantages of ITFS. Organizations now using ITFS could have initiated an almost identical service by using closed circuit (cable) television. However, the FCC realized that the costs of cable were often prohibitive, and saw fit to aid educational institutions financially by granting them exclusive rights to ITFS. It is not

inconceivable that a satellite teleconferencing system could also be treated as a separate entity for regulatory purposes.

A Case Study: The Wisconsin Teleconferencing User Study

In the user studies conducted at the University of Wisconsin it was found that the majority of current users of teleconferencing systems are from the educational community with some use being made by private industry. Even the use of teleconferencing systems by professionals such as doctors and lawyers now centers around the educational function and the services themselves are provided by educational institutions and the costs are shared by the users and the providers of the systems. A breakdown of these services into the technology utilized, the cost, and the funding source follows.

Systems Enumeration

1) Wisconsin Medical Dial Access Program (Medical and Nurses)¹³

Technology - A combination of In-wats and metered telephone lines are used to provide access to approximately 600 pre-recorded informational tapes.

Cost - approximately \$35,000/year. This includes personnel and telephone line charges. Expenditures on equipment to date has been in the area of \$5,300.¹⁴

Funding - Funding in the past has been from the United Health Foundation and HEW's Regional Medical Program Service. Tentative plans call for a yearly \$25. subscription rate for persons wishing to use the service and a per call charge for those not paying the annual subscription. The original design for the system calls for funding to continue only until the system becomes stable.

2) Wisconsin Heart Association Dial-Access (Green Bay and LaCrosse)¹⁵

Technology - The system uses standard telephone lines to provide access to tape libraries in the two cities. Any toll charges incurred are paid by the caller.

Cost - Green Bay - first year operating expense, including equipment - \$704 (including tapes [tapes and equipment were approximately \$300]). LaCrosse - first year operating expense, including equipment - \$650 (including tapes [tapes and equipment were approximately \$300]).

Funding - The Wisconsin Heart Association

3) Campus Dial-Access Telephone Information System (proposed)¹⁶

Technology - The system will use standard telephone lines to provide access to the tape library.

Cost - Estimated cost of operation for the first year, including equipment - \$859. This does not include the initial tape production cost of \$12.26 per tape. (Capital equipment costs are estimated at \$340.).

Funding - University of Wisconsin.

4) NEWIST (Northeast Wisconsin In-School Television)¹⁷

Technology - Instructional television programs, primarily rented instructional video tapes, are broadcast over commercial television station WLUK, Channel 11, to Green Bay Area schools. Future plans include broadcasting these tapes over Green Bay's state educational television station, Channel 38, which is in the construction stage.

Cost - NEWIST has been paying \$40,000 per semester to Channel 11 for the broadcast of two hours of instructional programming per day.

Funding - NEWIST receives funds from the Green Bay area schools which utilize the programming and from the State of Wisconsin's Educational Communications Board.

5) U.W. Green Bay Microwave System¹⁸

Technology - This system beams instructional microwave video signals from Green Bay to Marinette. It also utilizes telephone lines for a two way audio connection. Manitowoc and Menasha are included in the two-way audio connection.

Cost - \$12,400 per year for leasing the distribution system from Bell Telephone. All other costs are combined with other U.W. Green Bay operations.

Funding - University of Wisconsin - Green Bay.

6) West Bend - Sheboygan Classroom Link¹⁹

Technology - A "dedicated" telephone line will be used in the fall of 1971 to connect West Bend and Sheboygan classrooms, for the purpose of teaching a Spanish course.

Cost - estimated at \$1,700 for nine months of operation.

Funding - University of Wisconsin - Sheboygan, \$1,000
West Bend, \$700

7) American Automobile Association²⁰

Technology - AAA uses Wisconsin Telephone Company's telephone line conferencing facilities and radio station WIBU's broadcasting facilities to disseminate traffic information to 97 of the state's approximately 123 radio stations.

Each hour, during holiday weekends, AAA puts out a recorded traffic report for the state. WIBU transmits the message to Southeastern Wisconsin radio stations, but those that can't be reached in this manner (40) are contacted via conference telephone call each hour. Eight five-way conference calls are placed per hour.

Cost - The Telephone Company bill for holiday weekends is estimated to be in the area of \$800 per weekend.

Funding - American Automobile Association provides the service free of cost to the radio stations as a public service.

8) Madison Academic Computing Center²¹

Technology - The Computer Center utilizes telephone lines to provide central computer access to 12 remote terminals within the state, and to provide an open line voice link (loop) between those terminals and the computing center. This two-way voice loop serves in the area of systems maintenance in that the controller has an instant two-way communication link with the terminals and vice versa.

Cost - Telephone Company rates for the voice loop are \$17/month/station, plus approximately .75/month/mile of the loop, plus \$15/month/termination. The computer to terminal rates are the same per mile and per termination, but the monthly station rate is in the area of \$75-\$80.

Funding - State of Wisconsin - the majority of the terminals are within State buildings.

9) Wisconsin State Educational Television Network 22

Technology - The proposed network will utilize microwave relay links between Madison, Milwaukee, Green Bay, Wausau, Eau Claire, and LaCrosse. Programs originating in any of these locations would be beamed via microwave relay loop so the other locations can rebroadcast the programs to their individual areas.

Cost - Two bids for the microwave relay services were received. Wisconsin Telephone Company would charge \$65,000/year and Midwestern Relay would charge \$48,000/year for the service.

Funding - State of Wisconsin.

10) ETN-SCA 23

Technology - This system utilizes dedicated telephone lines and subsidiary communication broadcasts over the state's educational radio network, to program to and conference with numerous locations throughout the state.

Cost - The 1971-72 Budget request calls for the following figures: Personnel - \$54,035, System cost - \$69,552, Supplies and Travel - \$4,875.

Funding - University of Wisconsin - Extension. Individual enrollees pay a tuition for courses taken.

02

11) SEEN (Statewide Engineering Education Network)²⁴

Technology - This system utilizes dedicated telephone lines and the Victor Electrowriter to transmit engineering courses to 22 locations in Wisconsin and Northern Illinois. In addition to the electrowriter transmissions, two-way audio connections are maintained with all the remote classrooms.

Cost - The annual operating cost of the system is approximately \$55,000, \$13,500 of which goes for the rental of telephone lines. 90% of this telephone line charge results from the use GSA lines. Electrowriter transmitters cost approximately \$1,100, while each basic receiver runs in the area of \$1300.

Funding - University of Wisconsin-Extension. Basic operational costs are covered by tuition paid by engineers enrolling in courses. Other financial support is received from the Trane Company, Holt Industries, Kimberly Clark, and Ansul Chemical.

12) Wausau School District #1 Telewriter Project (not in service)²⁵

Technology - This system utilized dedicated telephone lines and the Victor Electrowriter to provide in-service educational programming for teachers in the participating schools districts. Two-way audio was maintained in conjunction with the electrowriter transmissions.

Cost - First year cost for the system was \$77,146,
second year - \$55,000, third year - \$47,000.

Funding - ESEA Title III Operational Grant

13) Milwaukee Archdiocese ITFS Operation²⁶

Technology - The Milwaukee Archdiocese beams one-way instructional programs to 101 receiving sites in 3 Wisconsin counties using ITFS. Three ITFS transmitters are presently used.

Cost - Annual operating cost is \$130,000. To date \$900,000 has been invested in the system. Receivers cost approximately \$130 each.

Funding - Milwaukee Archdiocese

14) Marquette University ITFS Operation²⁷

Technology - This system utilizes one-way ITFS transmissions to Milwaukee area locations (one transmitter, 2 channels).

Cost - Initial equipment and installation costs - \$33,628,
yearly operational costs - \$5,834.

Funding - Marquette University, Cardinal Stritch College and Alverno College.

15) University of Wisconsin - Milwaukee ITFS Operation²⁸

Technology - This system utilizes one-way ITFS signals for broadcasting instructional programming to Milwaukee area locations (one transmitter, 4 channels).

Cost - The system just began operation this fall so no operating expenses were available at this time. Equipment cost to date have been in the area of \$73,000. This includes the transmitter, antennas, and receiving equipment at 11 locations.

Funding - University of Wisconsin

16) Milwaukee Public Schools ITFS Operation

At the time the research was done this system was in the planning stages and not operational, therefore precise details and figures were not available.

17) Milwaukee Regional Instructional Television Station (WAU-27)²⁹

Technology - This system utilized ITFS transmissions in conjunction with telephone line feedback to provide instructional programming in the Milwaukee area (one transmitter, 2 channels).

Cost - Annual operating budget - \$32,000. Equipment costs and annual costs since the operation began in 1968 - \$150,000. The investment in federally owned equipment located at the Veterans Administration - \$183,000.

Funding - National Veterans Administration and institutions participating in the program.

18) Maxco International (Parts Retrieval Network)

Technology - This system utilizes dedicated open telephone lines on a continuous, 24 hour basis. This open network connects various auto salvage yards for the purpose of locating desired auto parts. Each subscriber is provided with a "continuous" speaker and a hand set. The subscriber's request for parts is heard over the entire system.

Cost - Maxco has a monthly telephone bill of between \$7,000-\$10,000.

Funding - Commercial operation financed by subscriber fees.

The average subscriber fee is \$145 per month. The system presently has 70-75 subscribers, one third of which are in Wisconsin.

While the sampling process within the State was limited by our terms of reference - State boundaries, and the resources available to use - the results indicate some definite trends in teleconferencing usage which may be of value to decision-making in the future regarding system configurations. Out of the eighteen teleconferencing systems which were examined it was found that ten utilized telephone lines either separately or in combination with some other transmission form. ITFS was used by four systems, and microwave was used by only two systems. Since there is currently no cable communications interconnection system, this transmission

means was not used. Since the majority of the systems used audio links only it may be assumed that television may not be significant in user evaluation of teleconferencing systems. On the other hand, cost figures and the lack of understanding of the potentialities may have led to this situation. One system utilizes telephone lines together with an electrowriter, but there have been difficulties with this system.

In Wisconsin, over \$600,000 is spent yearly on teleconferencing systems. This is a substantial figure and would come to over \$30 million dollars per year in the United States if a projection were made. While it is not suggested that this projection is accurate it does indicate possible sources of funding for teleconferencing systems. If an educational effort were undertaken it might even substantially enlarge this figure. One of the factors noted in the interviewing undertaken to provide the Wisconsin study was that the people were not generally aware of the technological possibilities of teleconferencing. Thus it is probable that an educational effort would vastly enlarge the number of users and the amounts of money spent on the systems.

Concerning funding sources for the existing teleconferencing systems, it was found that the majority of funds originated with the State and was administered

through its various institutions of higher education. There were only two services that had federal funding, one using HEW Regional Medical Program funds and the other using National Veterans Administration funds. In both of these cases, funding was also provided by the participating institutions. The two largest systems were both financed by educational institutions, one being the University of Wisconsin ETN/SCA system (\$127,462 per year) and the other being the Milwaukee Archdiocese system (\$130,000 per year). This is only logical since all of the systems operate only within State boundaries. The conclusion to be drawn from these facts, however, is that the systems are state-wide not because that is the limit of their content effectiveness, but rather because that is the limit of their funding competence. In the case of the medical dial-access system, other states must buy the system for their own region and thus create a duplication of facilities. On a regional basis much of this duplication could be eliminated. Similarly a number of the city-wide systems could share larger facilities if they were available and thus effect a savings. If funding were available on a federal level, it is most likely that certain of these teleconferencing systems would benefit from regional or national cooperation and cost-sharing.

One of the most interesting conclusions is that various groups are going ahead with the installation of teleconferencing systems that may not be the best for their needs and without any real understanding of the activities taking place in other parts of the state or other parts of the country. This haphazard development of teleconferencing systems may foreclose some of the optimum systems development that could be done if people were aware of the technological opportunities that were available to them. This overlapping should be eliminated if effective regional systems are to be developed, and the implementation of a domestic satellite system and possibly the development of a dedicated satellite teleconferencing system would encourage cooperation and coordination. An additional factor here is that the use of hardware by these systems is somewhat effected by the amount and sophistication of hardware sales in the region. Many of the people who are developing these systems do not have the time or funds to search out technological alternatives. The planning of a satellite teleconferencing system could provide the educational materials necessary to allow enlightened judgments to be made.

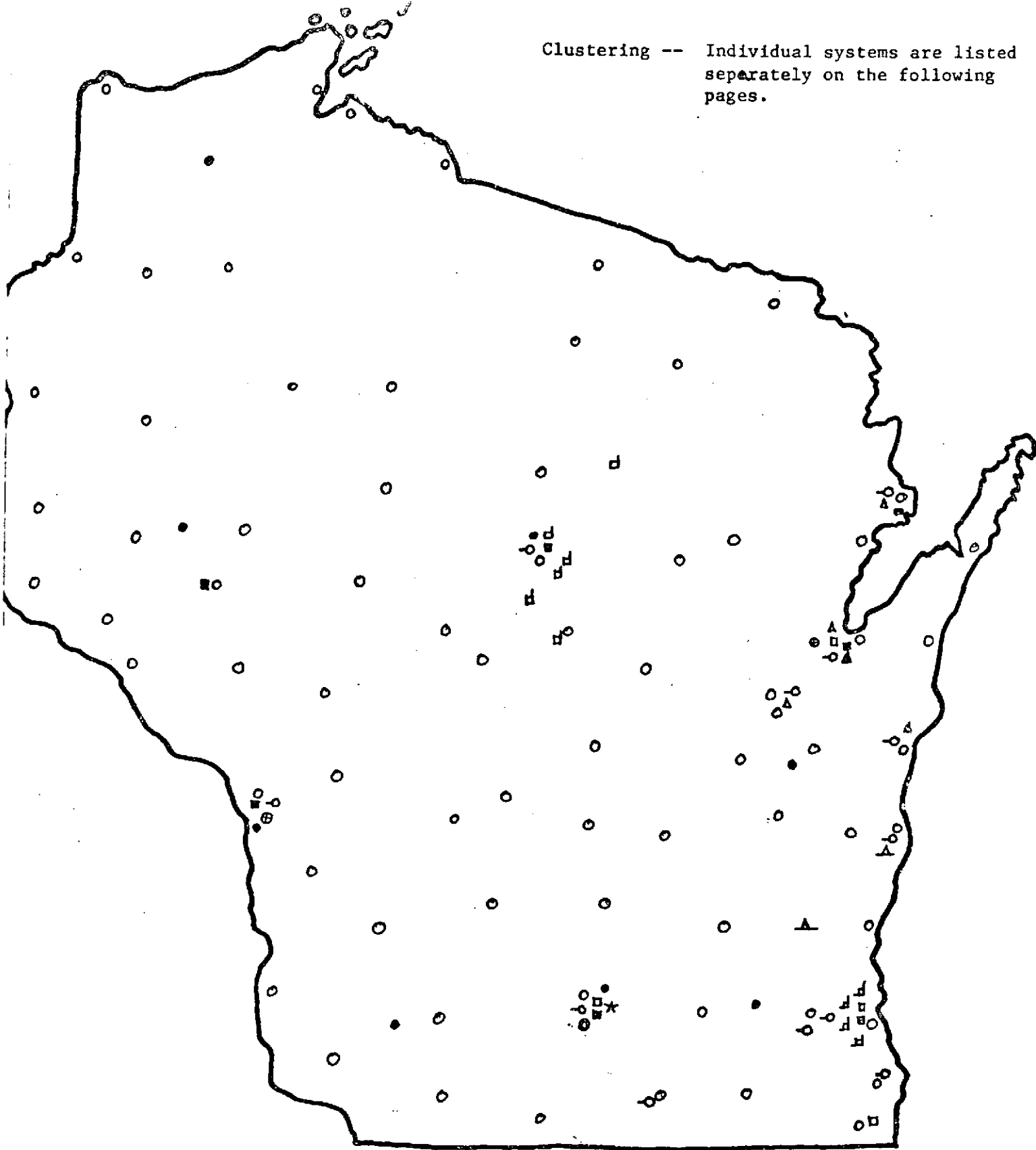
Demographic Dispersion

One of the factors which will help in determining the hardware mix which will be used by a satellite teleconferencing system will be the geographic dispersion of the users. Clustering of users will provide cost benefits for the use of ITFS or cable as opposed to some alternative systems. Microwave interconnection will prove most beneficial in some instances. Following are a series of outline maps of the State of Wisconsin indicating the demographic dispersion of the current users of the teleconferencing systems in Wisconsin. The first chart indicates the clustering for each service offered in the state. From this chart it can be seen that if all of the existing systems were to be accommodated in a regional satellite system that virtually the entire state would have to be covered. Even when individual systems are considered on the following charts it is evident that there is no apparent clustering in the majority of the services. However, where a system such as the Wausau School District system is considered it is obvious that there is clustering and this would also apply where only one city were participating in a system. Again, if more people were made aware of the possibilities of a system of teleconferencing it may be that even wider demographic dispersion would take place. In

the future, it will be necessary to conduct in-depth user studies to determine what the system configuration will be based on user needs and the funding sources that are available.

The use of teleconferencing systems within Wisconsin by professional people to date is limited to their use of educational services provided by the University for continuing professional education. However, it is possible that in the future this user group could be segmented and special services could be provided for them on a subscriber basis. The clustering studies done at Stanford indicate that doctors and lawyers work in close proximity to one another and that some system configuration would be possible. However, with the Wisconsin Medical Dial Access System it was found that the highest utilization of the system was in rural areas as opposed to urban areas with the conclusion being drawn that there are library facilities and other sources of professional interaction available in the cities that are not available in rural areas.

Clustering -- Individual systems are listed separately on the following pages.

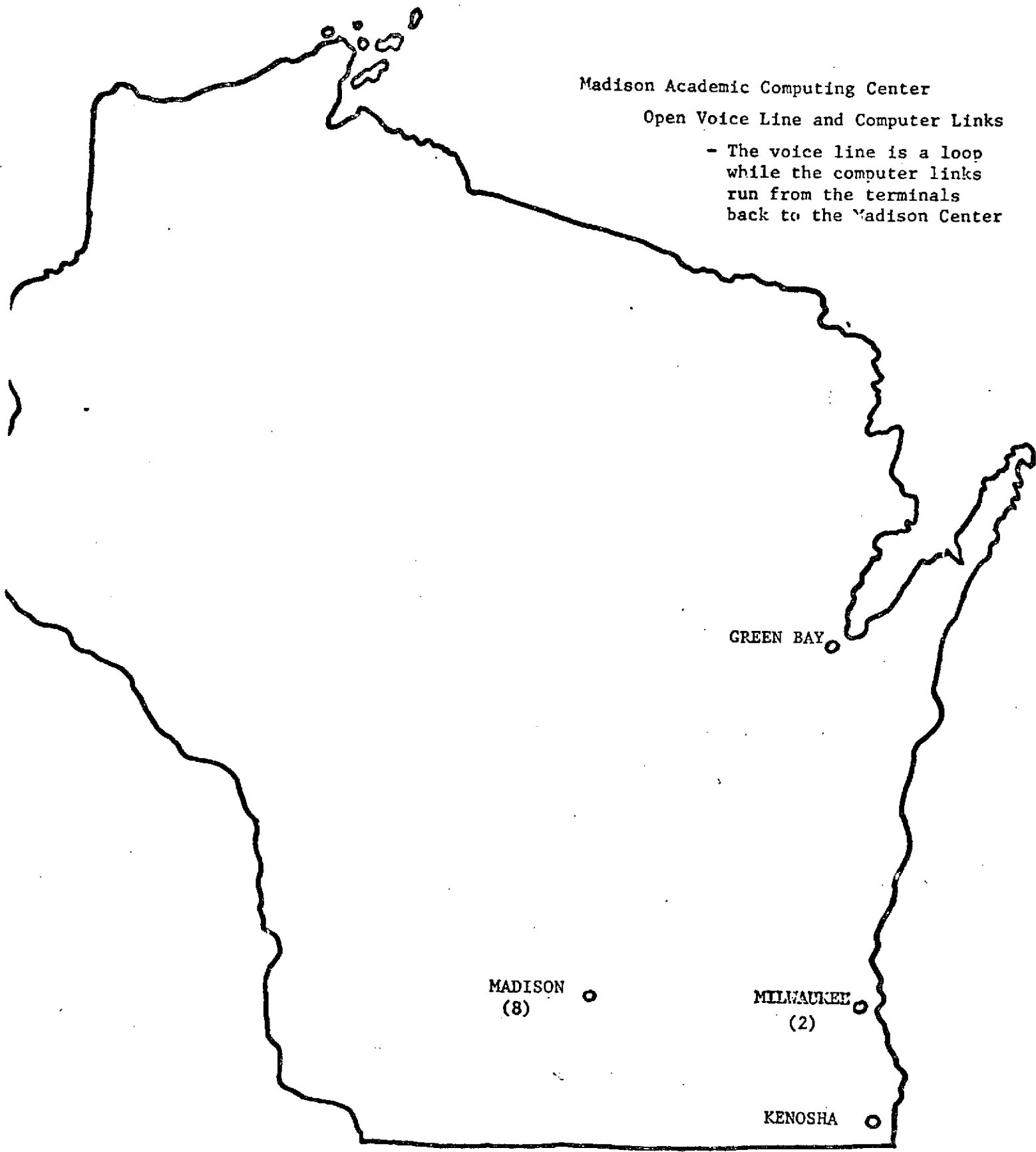


- | | | | |
|-----------------------------|--------------------------|-----------------------|---------------------------|
| □ Madison Computing Center | ○ SEEN | △ UW-GB Microwave | ⊕ Heart Assn. Dial ACCESS |
| ■ State ETV Network | ⊙ Campus Dial Access | △ NEWIST | |
| ▣ Wausau Telewriter Project | ○ ETN Locations | △ Sheboygan Link | |
| ▣ ITFS - Operations | ○ SCA Broadcast Stations | ★ Medical Dial Access | |

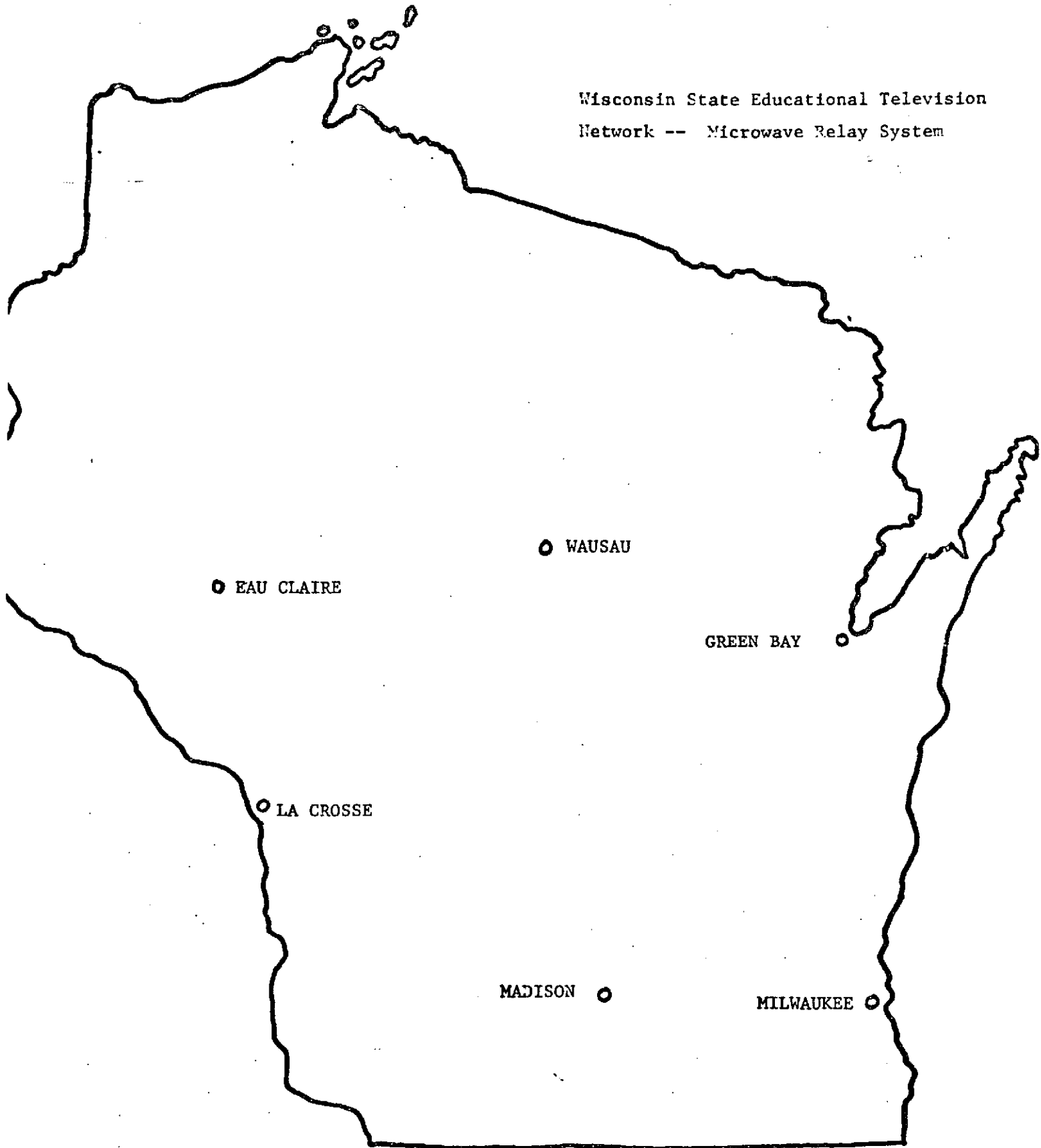
Madison Academic Computing Center

Open Voice Line and Computer Links

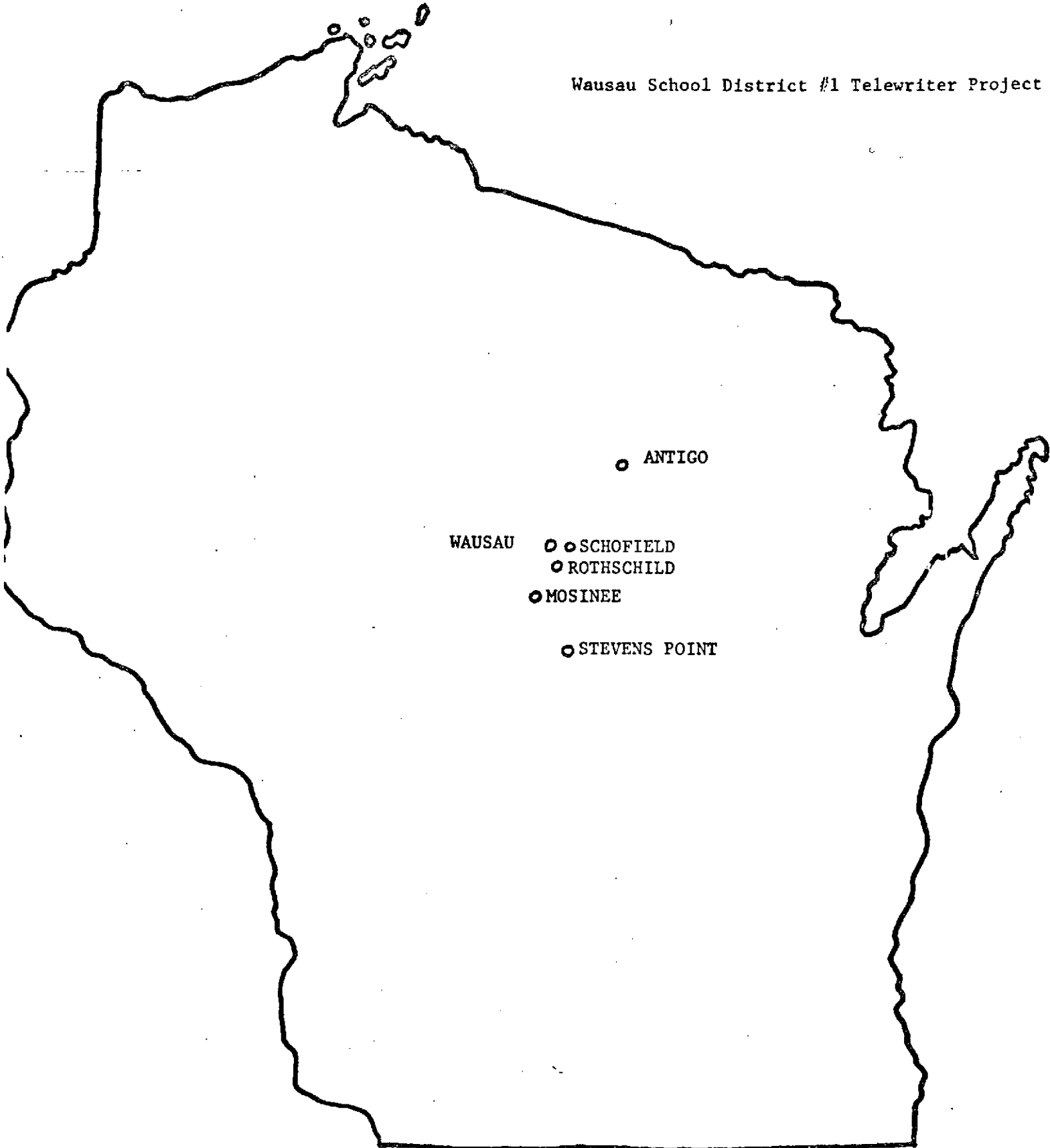
- The voice line is a loop while the computer links run from the terminals back to the Madison Center

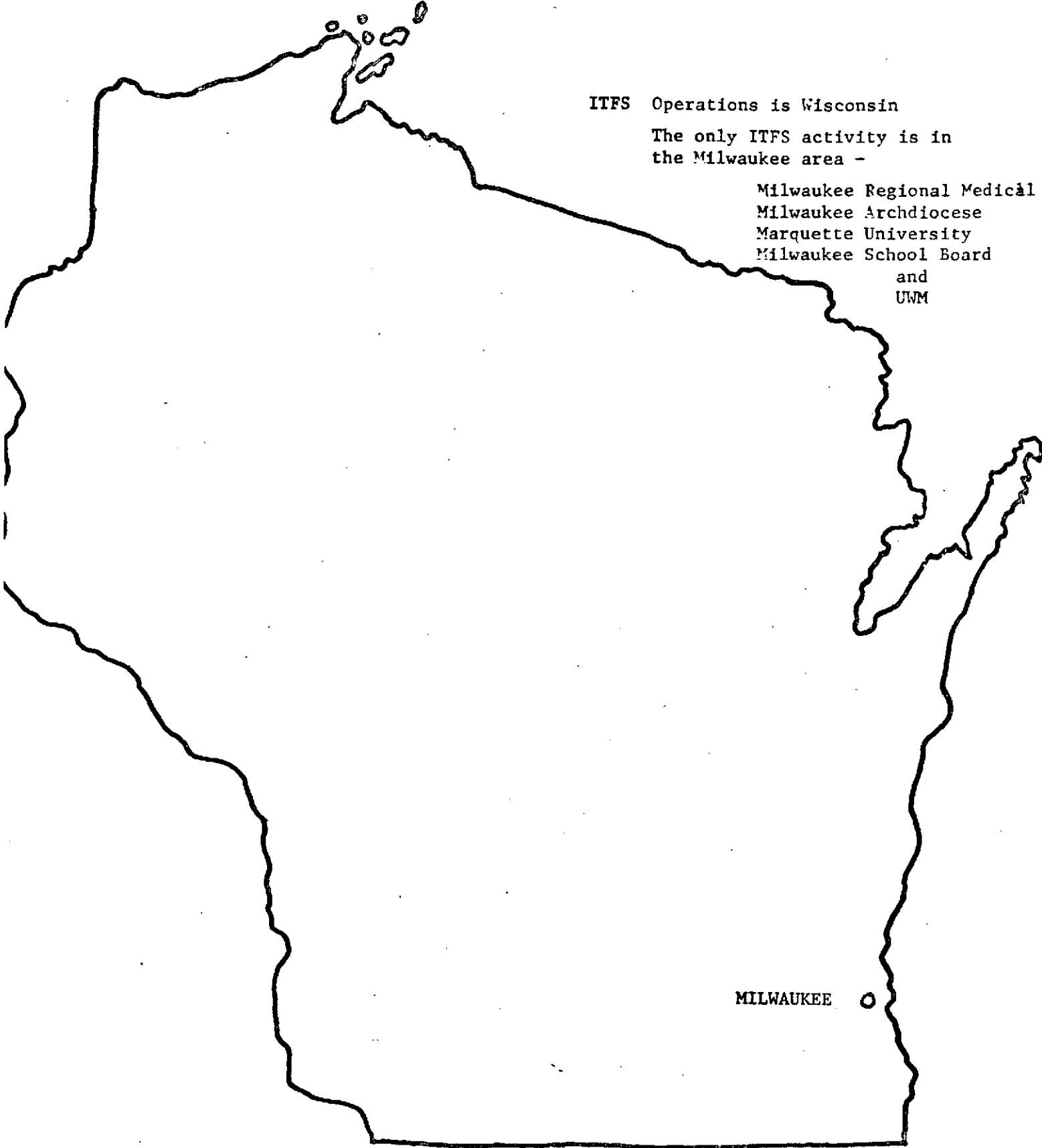


Wisconsin State Educational Television
Network -- Microwave Relay System



Wausau School District #1 Telewriter Project





ITFS Operations is Wisconsin
The only ITFS activity is in
the Milwaukee area -

Milwaukee Regional Medical
Milwaukee Archdiocese
Marquette University
Milwaukee School Board
and
UWM

MILWAUKEE ○

SEEN - Statewide Engineering
Education Network (Wisconsin Locations)

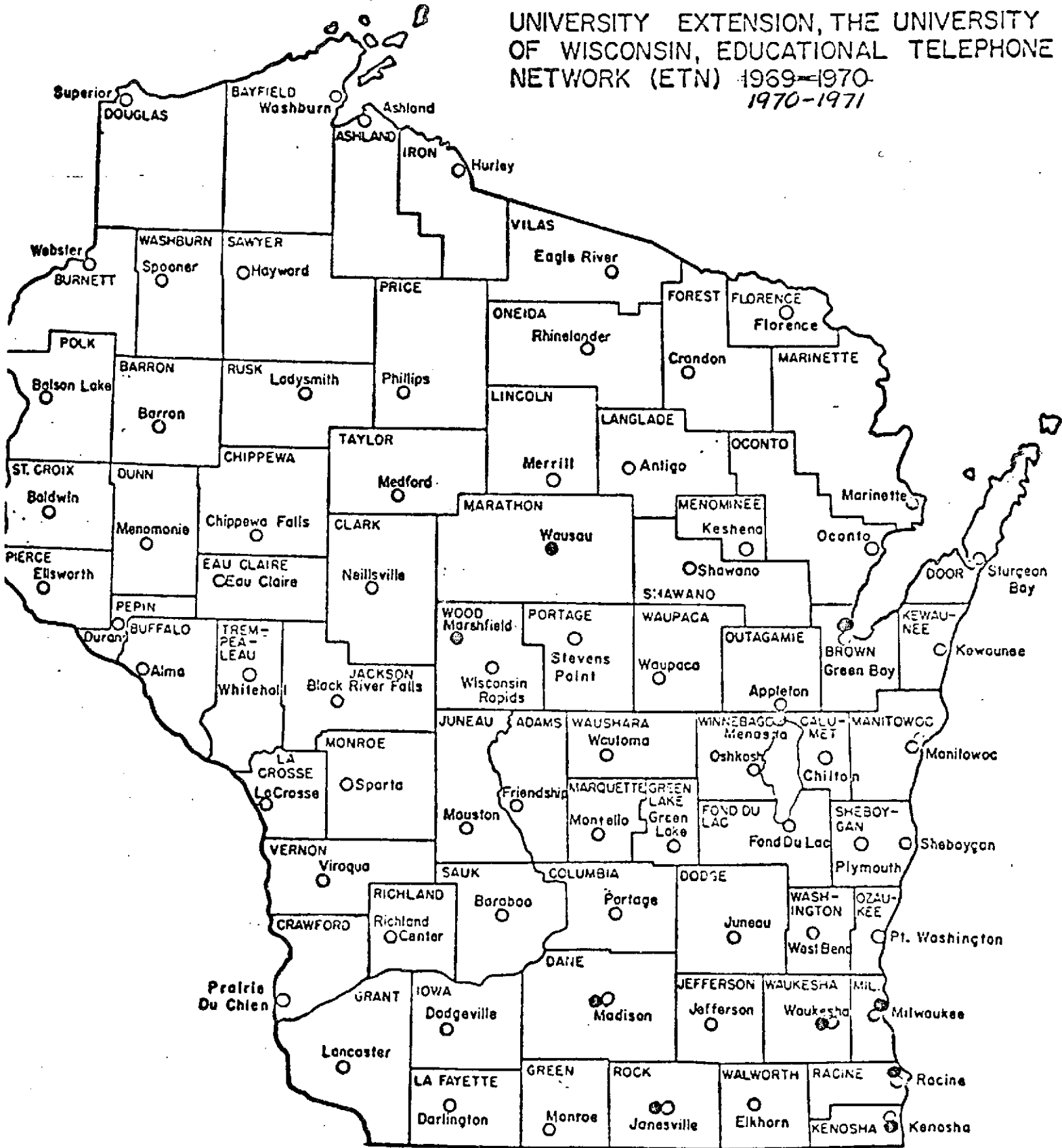


Illinois Locations - Belleville, Chicago, Decatur, Freeport,
Springfield, Quincy, Rockford, Rock Island, Morrison, and Champaign

University of Wisconsin's Campus
Dial Access Information System

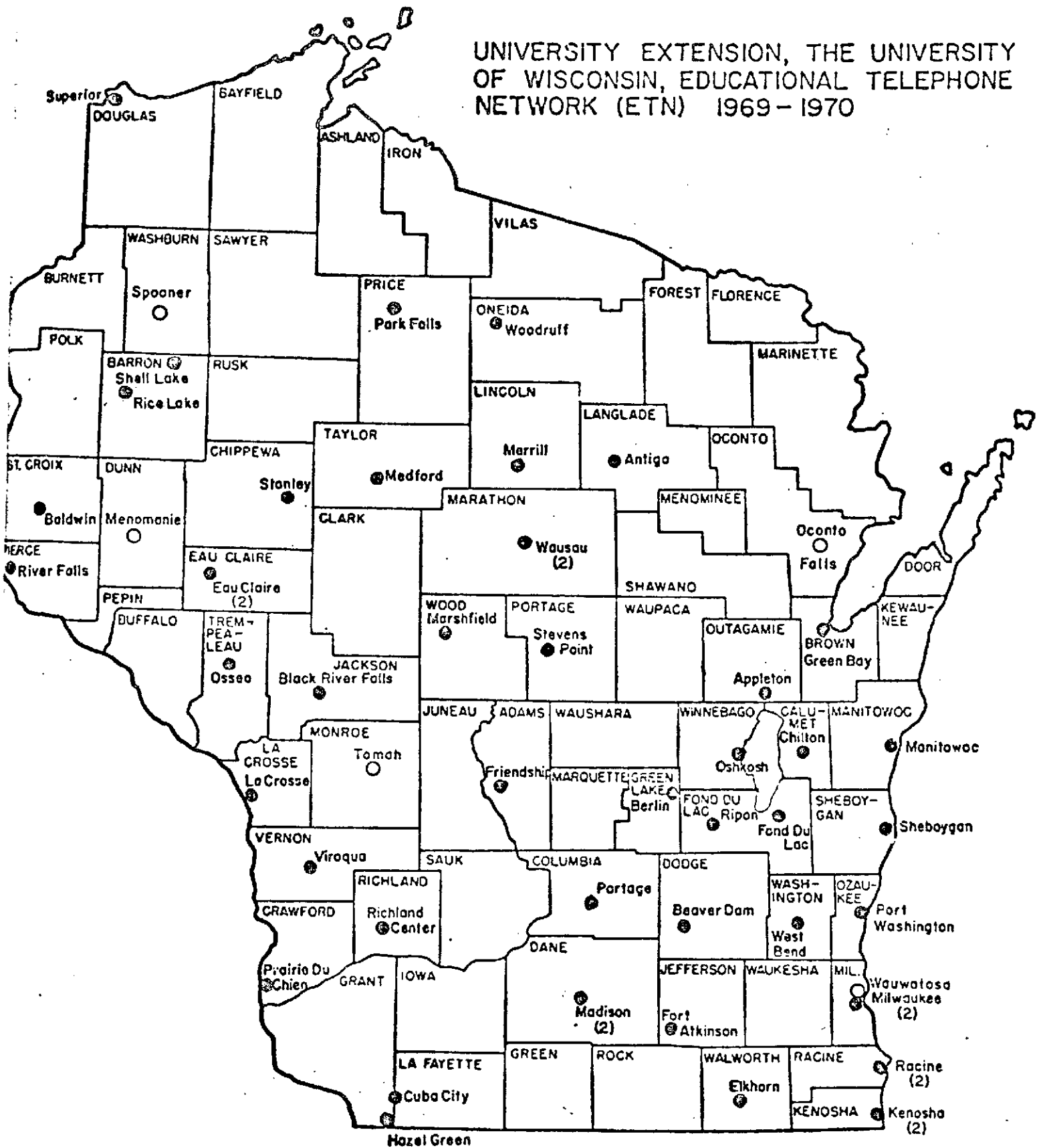


UNIVERSITY EXTENSION, THE UNIVERSITY
OF WISCONSIN, EDUCATIONAL TELEPHONE
NETWORK (ETN) 1969-1970
1970-1971



○ ETN UW CENTER LOCATIONS
● ETN COUNTY LOCATIONS

UNIVERSITY EXTENSION, THE UNIVERSITY OF WISCONSIN, EDUCATIONAL TELEPHONE NETWORK (ETN) 1969 - 1970

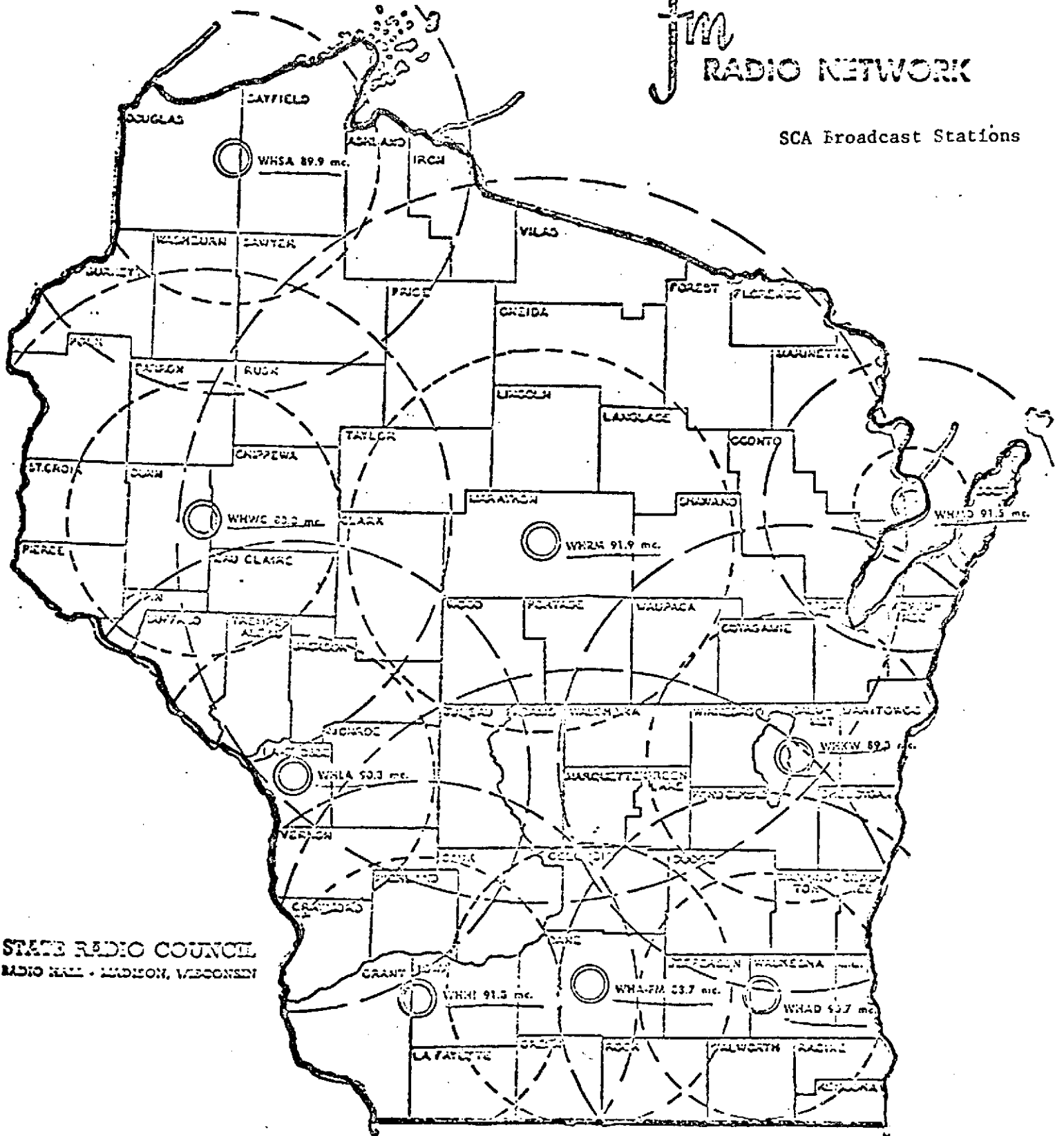


○ ETN HOSPITAL LOCATIONS

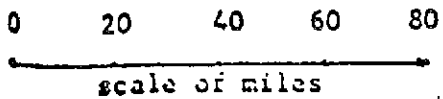
WISCONSIN'S

FM RADIO NETWORK

SCA Broadcast Stations



STATE RADIO COUNCIL
RADIO HOUSE - MADISON, WISCONSIN



Rural Coverage
50 mv/m
per meter

Urban Coverage
1000 mv/m
per meter

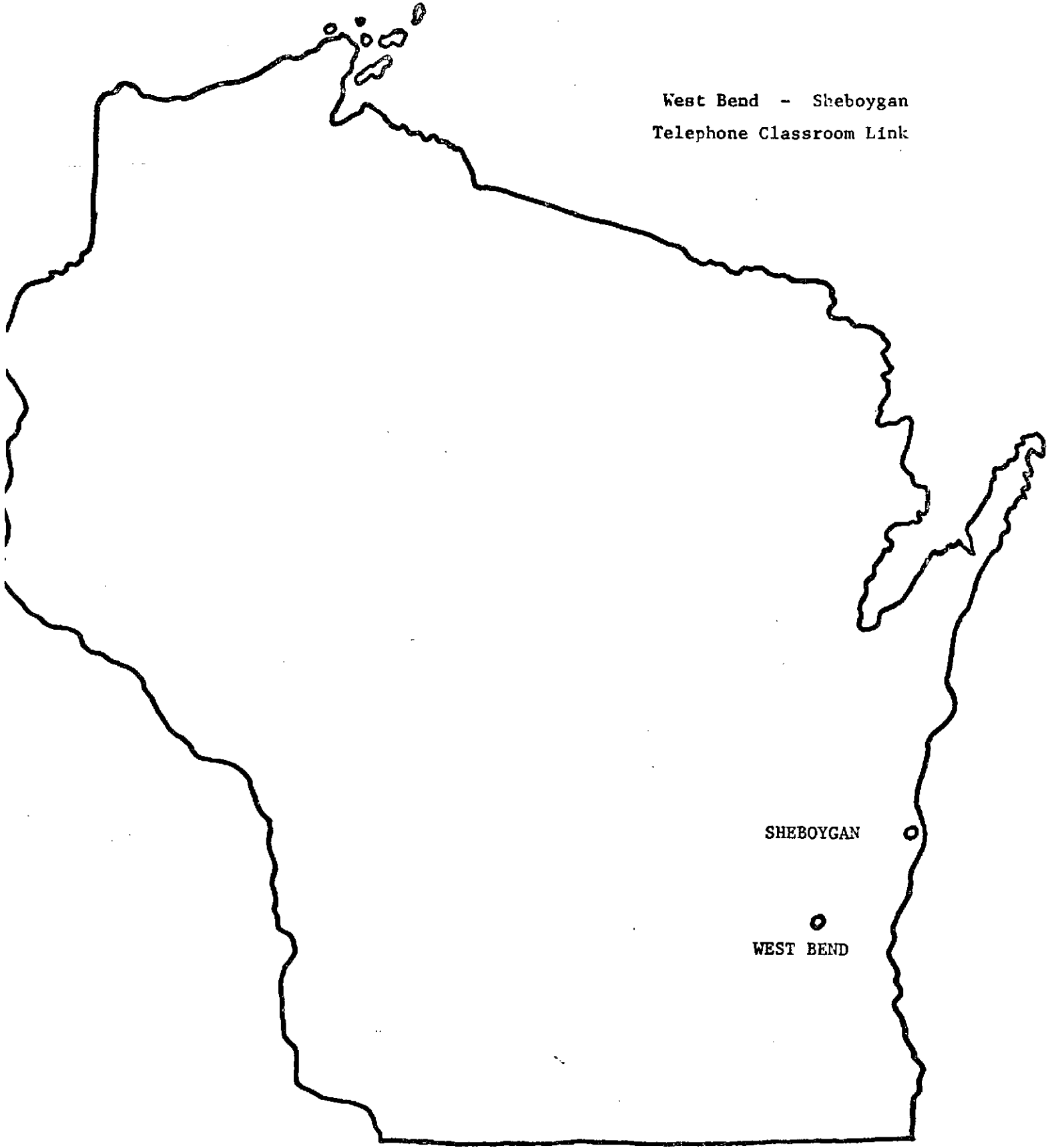
UW-Green Bay Microwave System
and Telephone Link



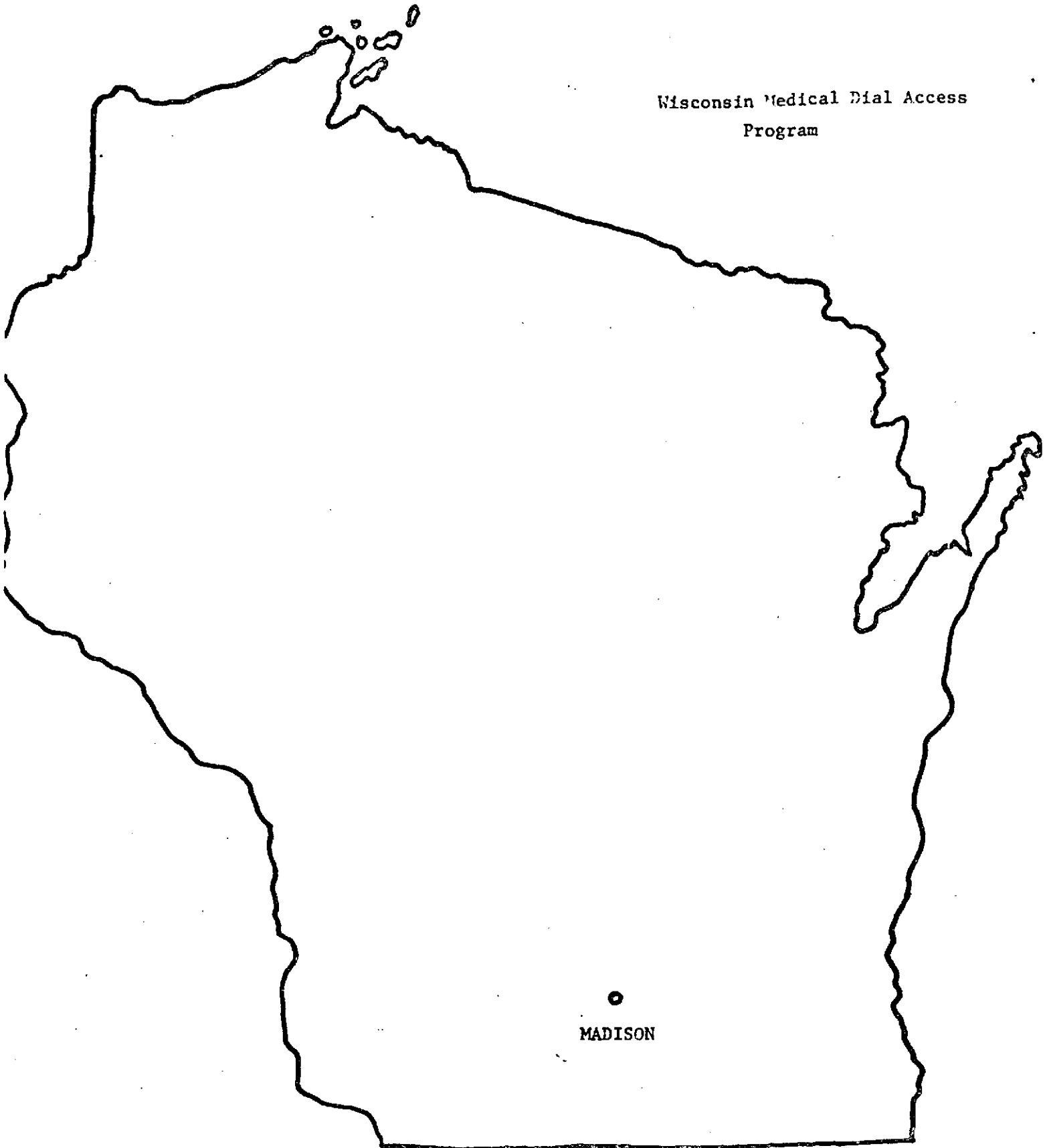
Newist - Green Bay Area
Instructional Television Broadcasting



West Bend - Sheboygan
Telephone Classroom Link

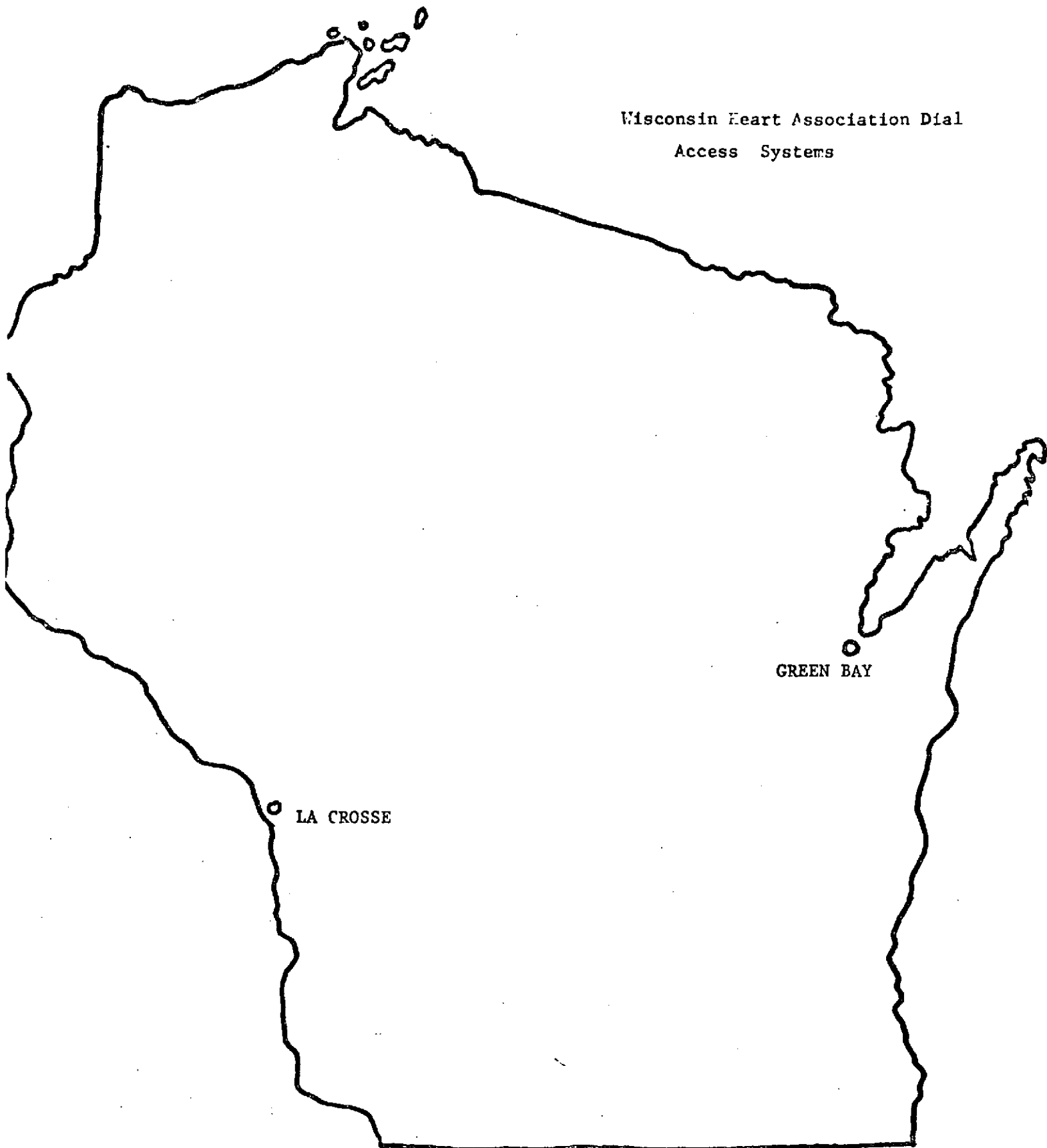


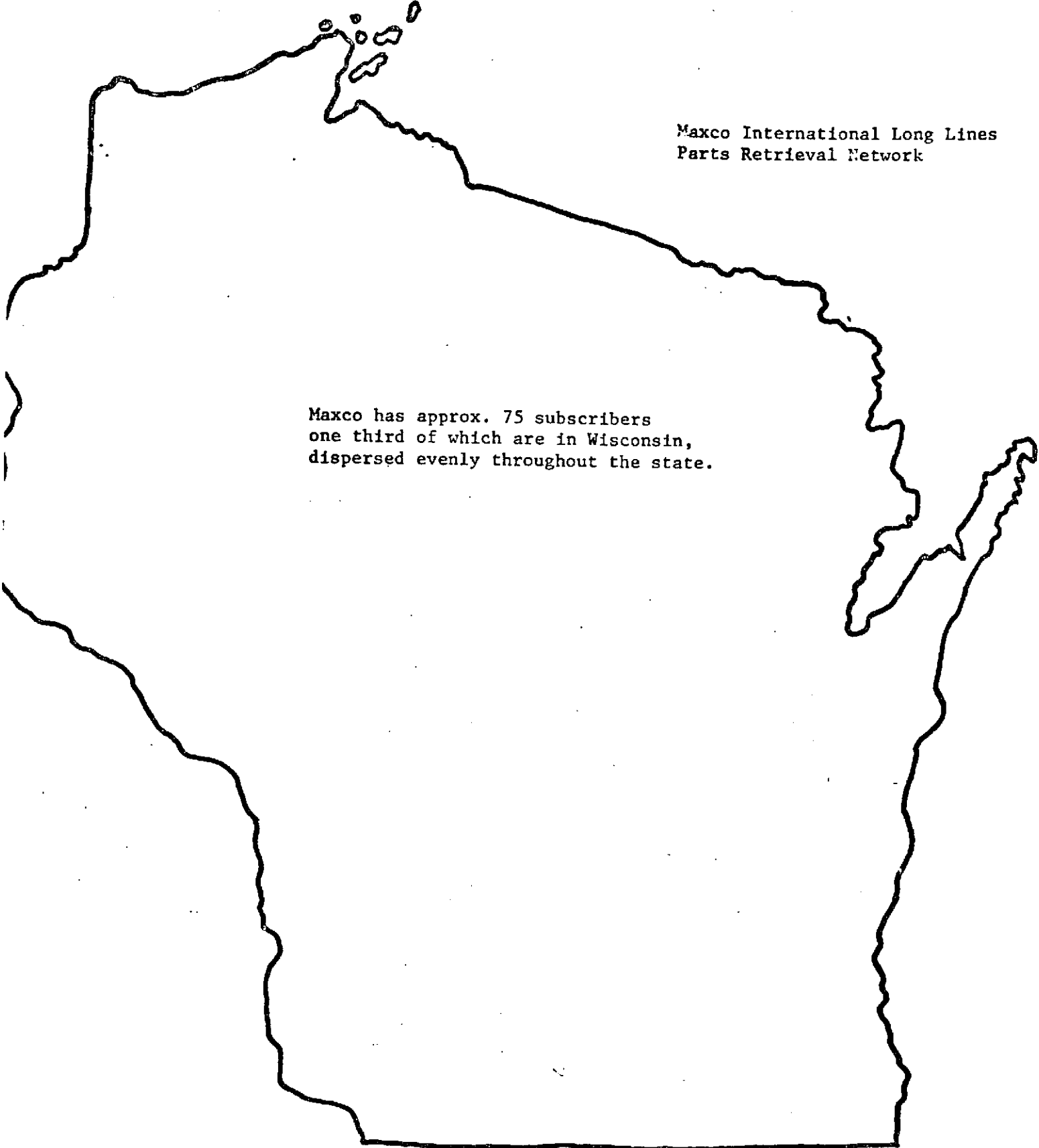
Wisconsin Medical Dial Access
Program



MADISON

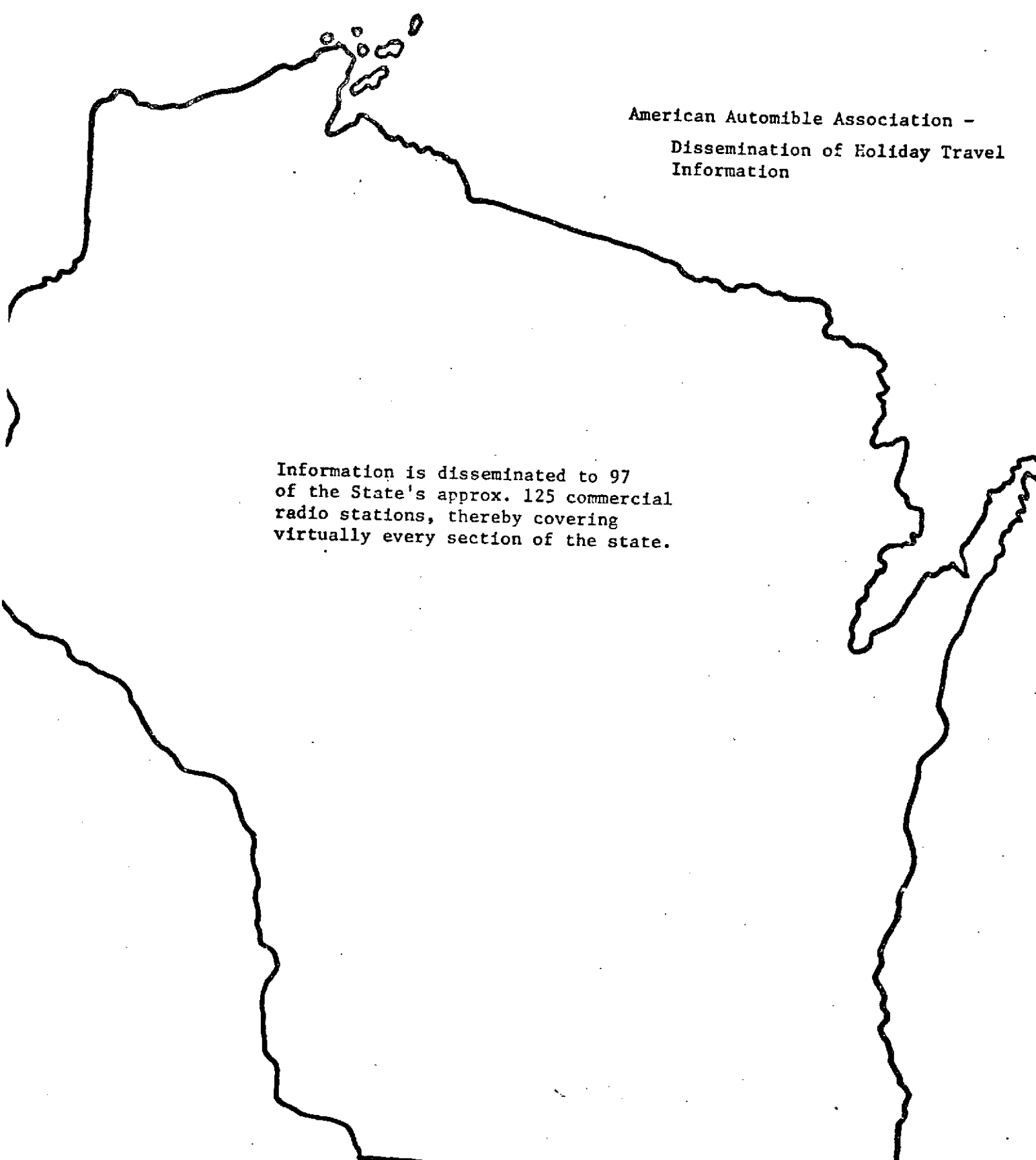
Wisconsin Heart Association Dial
Access Systems



An outline map of the state of Wisconsin, showing its irregular borders and the Upper Peninsula in the north. The map is drawn with a thick black line on a white background.

Maxco International Long Lines
Parts Retrieval Network

Maxco has approx. 75 subscribers
one third of which are in Wisconsin,
dispersed evenly throughout the state.

An outline map of the state of Wisconsin, showing its irregular borders and the Upper Peninsula in the north. The map is drawn with a thick black line on a white background.

American Automobile Association -
Dissemination of Holiday Travel
Information

Information is disseminated to 97
of the State's approx. 125 commercial
radio stations, thereby covering
virtually every section of the state.

The International Implications

The development of a domestic satellite teleconferencing system has vast implications for international developments of a similar nature. Educational goals may be achieved by satellite teleconferencing and therefore it would be desirable for the domestic United States regulatory position to be one which favors international development. As Clay T. Whitehead said in a recent speech in Paris:

It is conceivable that for the cost of a few billion dollars a year one could provide a global EDSAT system which could someday lift this whole planet out of ignorance, which is the cruelest form of disadvantage.³¹

Whitehead continued by stating that the basic problem goes beyond the organization of our international agencies and the procedures that they employ. The problem that he saw concerns our fundamental institutional regulatory theory and the need for the development of competitive policies rather than monopolistic policies. He further advocates the view that the problems of communications technology cannot be solved in a narrow technical framework but must be considered in the context of their political, social, and moral implications.

All of the above indicates that international concern with the development of a satellite teleconferencing system for educational purposes might require a minimum of regulation with all attempts being made to ease the development of the appropriate technology.

One example of the international implications of teleconferencing development which has, in fact, also determined the frequency at which educational satellite broadcasting will be conducted in the United States, is the World Administrative Radio Conference which was held in Geneva, Switzerland this past summer. The need for frequency allocations for educational purposes has been growing at an increasing rate over the past few years and will continue to do so in the years to come. The U.S. Office of Education has documented a wide range of current educational uses of telecommunications, including over-the-air TV broadcast, ITFS, and closed circuit television, facsimile and data transmission information, retrieval and computer-assisted-instruction. In many of these instances the availability of a low cost satellite teleconferencing system would result in improved service and lower costs for developing countries.

The Department of Health, Education and Welfare stated the importance of obtaining satellite distribution for educational use in its reply to the FCC prior to and in preparation for the WARC meeting.

Education is currently accused of irrelevancy; properly applied, technology can help solve this problem. By providing timely, high quality programming through a system of interconnection that links colleges and universities, primary and secondary schools, pre-school and adult education centers with distribution centers that provide only the best in programming, the nation can vastly improve its educational system. National production and distribution centers are vital to this plan. Only in this manner can the necessary excellence of programming be achieved, and the costs be spread over the widest possible audience, and thus reduced. Satellite communication is the most cost-effective method of providing this service. It is used exclusively by commercial networks as the only economically feasible means of distributing large amounts of information.³²

Following is an excerpt from the U.S. Proposals for WARC dealing with the interests of the educational community which indicates governmental concern with the educational community.

The health, education, and other public service interests have put forward a requirement for a low cost video band-width satellite system to meet the needs of hospitals, schools and universities. The 2500-2690 MHz band is particularly suited to meet these public service requirements since present technology and existing services permit a low cost multi-point satellite system to be developed in this band. The

services envisioned fall into principal categories, (a) the distribution of TV program material direct to educational broadcast stations for retransmission to individual receivers, and (b) the distribution of TV and other video bandwidth materials to schools, universities and hospital receiving installations. The type of satellite contemplated for this service would be capable of producing EIRP in the range of 45-50 dBW. The technical constraints on sharing between this satellite service, and terrestrial Instructional Television Fixed Service systems in current use in North America have been explored in a document to be submitted by the U.S. to the Special Joint Meeting of CCIR Study Groups (Geneva, February 1971) which shows that even under worst case conditions no interference would be caused by the above described satellite to any terrestrial Instructional Television Fixed Service. Because the earth station reception equipment will be simple and very low cost, an allocation to the communications satellite service in this band could also provide important communication services of a demand assigned multiple access nature in many regions of the world where present communications are not highly developed. Directional antennas on the satellites will make it possible for different countries, and/or regions to share the same orbit and spectrum space, conceivable even from the same satellite. If this band of frequencies were used worldwide for educational and public service space systems, the benefits of present space technology in this band could accrue directly to many developing and progressive nations.³³

Of particular interest here is the fact that a number of national delegations to the WARC were concerned with the development of satellite systems for developing countries and particularly for educational purposes, and further that interest was expressed in the possible development of interactive systems.

At the WARC itself,³⁴ an allocation was made on a global basis at 2.5 GHz for educational purposes. This decision illustrated the belief that, as times change, so must the policies of entities possessing the potential to aid education. The allocation of the 2500-2690 MHz band to education was achieved because the nations of the world recognized that the availability of satellite communication could quite possibly result in improved educational services and lower costs. In effect, WARC decided that the technological innovation of satellite communication should not be kept from educational interests, but should be made available to them.

It is especially important to note that the 2500-2690 MHz band was allocated on a world-wide basis despite substantial opposition from some European and Asian countries where this frequency band was already being used for Fixed Service (FS), Mobile Service (MS), and Radiolocation Service (RS). In this case the needs of education were deemed to be more important than those of commercial interests, and education was granted special treatment by the international community.

The above arguments all support the general policy position taken at the United States federal level that educational interests should receive

preferential negotiated tariffs in their use of common carrier facilities. If this is so, then it is likely that the international community would favor international standards that would encourage satellite teleconferencing for educational purposes and it can be argued that a domestic regulatory policy should be adopted which will also provide encouragement.

Educational Access

Given the fact that a satellite teleconferencing system may be largely used by educational interests, it becomes important to consider whether special consideration should be given to educational access to a satellite teleconferencing system or whether operated by the federal government or by a private entity.

The question of whether educational interests should be accorded preferential treatment in a satellite teleconferencing system may make a significant difference as to the resultant industry/government structure. There are a number of arguments that can be made for the proposition that if educational users are the primary users of a satellite teleconferencing system that the system should provide a preferential tariff structure for them even if common carrier lines or other regulated transmission means are used, since it is the entire system itself that is being charged for. In any event, the argument can be made that in general a reduced tariff ought to be made available. Following are some of the arguments that can be offered in this area.

The argument can be made that the imposition of a commercial tariff would be unreasonable and might in fact result in a number of educational services being withdrawn. It could be argued that a satellite teleconferencing system is a specialized interconnected network and that it provides unique services and as such should be subject to negotiated tariffs when using common carrier lines. Through the negotiation of special tariffs reductions could be provided for to encourage certain types of teleconferencing activities that would have a beneficial social purpose. If special tariffs were not provided for it might be that just those segments of the population that it was considered desirable to reach via an educational teleconferencing system would be precluded because of a high participant cost.

There is much evidence for the proposition that it is the intent of Congress to ensure the optimum utilization of the available means of communication for educational purposes at reduced cost. Section 803 of the Higher Education Act of 1965 states that:

[P 9964B] AUTHORITY FOR FREE OR REDUCED RATE
COMMUNICATIONS INTERCONNECTION SERVICES

Sec. 803. Nothing in the Communications Act of 1934, as amended, or in any other provision of law shall be construed to prevent United States communications common

carriers from rendering, subject to such rules and regulations as the Federal Communications Commission may prescribe, free or reduced rate communications interconnection services for interconnection systems within the purview of this title, whether or not included in a project for which a grant is made under this title.

The broader provisions referred to which describe the systems contemplated by Congress are described as follows in a general description of the "Networks for Knowledge" provisions:

§ 1778 NETWORKS FOR KNOWLEDGE

A new program was established in 1968 which permits groups of colleges and universities to share technical and educational facilities and resources through cooperative agreements. The Commissioner of Education is authorized to make grants and contracts with public and nonprofit colleges and universities, other public and nonprofit organizations, such as professional and academic groups, and private profit-making agencies, for all or part of the costs of planning, developing, or operating projects (.05).

Eligible projects, which begin in fiscal 1970, may include: joint use of classrooms, libraries, laboratories, books, materials, and equipment; establishing library networks by preparing catalogs and other materials for electronic transmission to provide joint access to specialized library collections; establishing and jointly operating closed-circuit television facilities; establishing and jointly operating electronic computer networks in which the institutions share a computer for such purposes as financial and student records, student course work, or transmission of library materials (.10).

There are no limits on the use of computers as part of an educational network; however, grant funds for establishing joint access to library collections may not be used to pay for electronic transmission terminals.

Funds for establishing and operating the computer networks may not be used to pay for operating terminals at participating institutions. Costs of using the central computer facilities are not allowed unless the costs are used to develop the program, maintain the facilities, or to pay the line-access costs of the participating institutions.

The law also authorizes free or reduced rates for communications interconnection services used in this program, subject to the regulations of the Federal Communications Commission (.20). Planning grants are authorized for fiscal 1969.

.05 Higher Education Act of 1965, P.L. 89-329, Title VIII, Sec. 801(a), as added by Higher Education Amendments of 1968, P.L. 90-575. Text at P 9964.	.10 Sec. 801 (b)
	.15 Sec. 801 (c)
	.20 Sec. 803. Text at P 9964B.

It can be argued that the above reference to the joint issue of classrooms includes a teleconferencing service like ETN and that it is also similar to the joint operation of a closed circuit television system. It is also apparent that the type of activities that are listed are those which will improve the educational uses of communications means in the same way that the majority of educational teleconferencing systems will.

In the Education Amendments of 1971 found in the Report of the Committee on Labor and Public

Welfare of the United States Senate on S. 659
to amend the Higher Education Act of 1965, the Net-
works of Knowledge provisions are extended to
fiscal 1975.

PART H--NETWORKS FOR KNOWLEDGE

Part H of title I extends and amends title VIII of the Higher Education Act of 1965. Such title VIII authorizes grants to institutions of higher education and combinations of such institutions to encourage them to share their technical and other education and administrative facilities and resources. Funds appropriated for title VIII may be used for the development and operation of inter-instructional arrangements such as--

(1) the joint use of facilities, such as lecture halls, classrooms, libraries or laboratories;

(2) the establishment of library networks which provide access to collections of materials in the possession of a number of institutions;

(3) the establishment of joint operation of closed circuit television facilities;

(4) the planning and operation of electronic computer networks.

Part H extends the authorization for Networks for Knowledge for four years, through fiscal 1975. Although this program has not yet been funded, the Committee believes that its continued authorization is necessary.

Part H also amends title VIII of the Higher Education Act of 1965 by making clear that law libraries and resources of law schools and other professional schools are to be included in part of the Networks for Knowledge program.

The Public Broadcasting Act of 1967 (Public Law 90-129-Nov. 6,7, 1967) also contains references to Congressional Declarations of Policy concerning the public interest in educational use of communications facilities, and specifically the Corporation for Public Broadcasting:

Sec. 396. (a) The Congress hereby finds and declares--

(1) that it is in the public interest to encourage the growth and development of noncommercial educational radio and television broadcasting, including the use of such media for instructional purposes;

.....

(3) that the encouragement and support of noncommercial educational radio and television broadcasting, while matters of importance for private and local development, are also of appropriate and important concern to the Federal Government;

(4) that it furthers the general welfare to encourage noncommercial educational radio and television broadcast programming which will be responsive to the interests of people both in particular localities and throughout the United States, and which will constitute an expression of diversity and excellence;

(5) that it is necessary and appropriate for the Federal Government to complement, assist, and support a national policy that will most effectively make noncommercial educational radio and television service available to all the citizens of the United States;

When the above references are directly related to educational radio and television, the use of long lines for educational teleconferencing services

closely approximates radio and in fact improves on the transmission facility in that responses can be elicited from the audiences involved. Thus it is possible to argue that the same policy factors should affect the development and rate structure for satellite educational teleconferencing.

In addition, the 1967 Public Broadcasting Act contains in Section 396 (h) the "Authorization for Free or Reduced Rate Interconnection Service":

(h) Nothing in the Communications Act of 1934, as amended, or in any other provision of law shall be construed to prevent United States communications common carriers from rendering free or reduced rate communications interconnection services for noncommercial educational television or radio services, subject to such rules and regulations as the Federal Communications Commission may prescribe. (48 Stat. 1064: 47 USC 609).

The rules for implementation of the above provisions were adopted on April 9, 1969 (17 F.C.C. 2d 155).

Thus any planning for an educational satellite teleconferencing system should consider sources for revenue which do not require the imposition of commercial tariffs on the operators of the system. While the tariff arrived at may be free or reduced, it is probable that public pressure in the educational area would result in user subscription fees not providing significant revenue, and thus some form of subsidy would be needed. The conclusion here is that common carrier tariff structures will not inhibit the development of an educational satellite teleconferencing system.

The ultimate argument to be made with respect to educational access to an educational satellite teleconferencing system is that free service should be provided. The rationale is that the general public has invested over twenty-five billion dollars in the general space program and that therefore any benefits to be derived from technological advances should accrue directly to the people. Section 396(h) of the Public Broadcasting Act of 1967 quoted above gives the justification for a free service, and although it does not precisely order such a service provision, it does suggest that the Commission could prescribe it. The Ford Foundation proposal for a broadcaster's non-profit satellite service had provided much of the impetus for this provision and at the time of the hearing before the Subcommittee on Communications of the Senate Commerce Committee the proposition was endorsed that the savings produced by satellite technology were an appropriate source of support for public broadcasting. The inclusion in a number of domestic satellite offerings for free circuits to be provided to the Corporation for Public Broadcasting also indicates a policy that education ought to have some free use of a commercial domestic satellite system. Thus, if a dedicated educational system were developed, it would only be logical to consider the terms under which the educational community would utilize the system. All of the arguments used to support the

proposition that public broadcasting ought to be given free use of a commercial system could also be used in arguing for free services provided on a teleconferencing satellite system.

In the Senate hearings preceding the Public Broadcasting Act of 1967 the President of the American Broadcasting Corporation stated:

Since our original proposal, ABC has constantly advocated that in any domestic satellite system - either one operated by ABC or in a more likely dedicated system for broadcast purposes operated as a joint venture by the networks - educational television should be given free use of such satellites for transmission of programs to their stations.³⁵

The idea of a "peoples dividend" has not gained wide visibility at the present time but it is entirely possible that as commercial domestic satellite systems begin operations that the issue will become a significant one.

The counter-arguments to this idea have primarily dealt with the question of the unreality of the concept of free service. The argument is that if one user does not pay for the service that payment must be obtained from other users or from the owners of the system. The answer has been that the public has already paid for the service since the developers of satellite systems have received public subsidies for their work and that the provision for free rates merely extends this idea of subsidy.

Further, the incremental cost of free services would probably prove to be a small part of the cost of the entire system.

While it is possible that the commercial domestic satellite systems will make circuits available for educational purposes,³⁶ it is more likely that a separate educational satellite system will need to be developed.

The benefits...for American education will be possible only if non-profit systems are established. While projected costs indicate that the educational community could pay the costs of space and ground hardware, computers and classroom terminals and still realize substantial savings in the ever-increasing costs of education, these savings appear to be possible only in a system which stands outside the common carrier market.³⁷

The development of an independent, noncommercial satellite system is felt to hold great promise of public benefit, and that studies must be conducted in order to ensure that this development is given every chance for success.

Worthy of fullest exploration is the idea that an independent noncommercial satellite system may be desirable. Such a system might, or might not, share space and ground hardware with a commercial system, but each system would be free to pursue its own goals with a minimum of compromise and confusion. Precedent exists on the ground, where noncommercial broadcasting exists outside of the framework of its commercial counterpart. To a wide spectrum of noncommercial users, it would offer the opportunity to design a system based upon their own needs, and to escape the present constraints of service-oriented tariffs and block allocations which prevent the small user from achieving economies of scale. Many noncommercial applications, not presently viable, might become attractive.³⁸

The separation of an educational and commercial system may prove exceedingly difficult in terms of regulatory policies. The educational portion of the system might be user-supported or government owned and controlled. In either event it is likely that federally sponsored programs would constitute a large part of the programming and therefore there would be some government involvement.

Despite various alternative configurations for an educational satellite teleconferencing system, it is likely that the financial support from user fees will not be adequate to meet the costs of an effective system. Thus it becomes a question societal priorities. As the Joint Council on Educational Telecommunications pointed out to the FCC:

This Commission has heretofore acknowledged that assistance and support must be provided to advance those indispensable functions of society that cannot compete on a commercial basis for an appropriate share of national resources. Within any satellite communications system, as within other communications media, the Commission must be assured that there is ample room for satisfaction of the needs for these alternate, public-interest services, as well as for the needs of commercially-oriented communications services.³⁹

The needs of the educational community will only be partly met by the development of the space and ground station segments of a satellite teleconferencing system. There will also need to be educational software development. Along with this there will be required research into the

best configuration of media technology from an educational point of view. Once the optimum deliver systems are decided upon, the question will arise of who should be responsible for the programming. One option would be to provide incentives for private firms to enter into the educational software production and distribution market. Incentives may be provided for cable television system operators to develop educational programming. There already have been plans suggested for levying a 5% gross proceeds tax on these systems to provide for educational broadcasting material. The same rationale could be used to obtain funds from the domestic satellite companies that are permitted to operate by the FCC. This fund collection would be in addition to the free circuits being provided to the Corporation for Public Broadcasting by a number of the domestic satellite companies. The concept of providing free use for educational users of the excess capacity of commercial domestic satellite systems may also provide a means of expanding educational utilization of the system. The long term benefits of this arrangement may be questionable but since prime user hours differ with the commercial and educational users, it is possible that this could provide an interim solution to the problem. As the Joint Council on Educational Telecommunications stated:

We concur in the view that provisions made by any satellite applicant for public broadcasting should include opportunities for other forms of educational telecommunications. Further, we find attractive and reasonable the MCI-Lockheed concept that the educational community should be able to tap without cost the commercial satellite operators' excess capacity. We urge the Federal Communications Commission to keep these two principles in mind in examining all of the applications for domestic satellite service which it now has before it.⁴⁰

The satellite teleconferencing system can provide the opportunity for testing and evaluating these additional means of educational telecommunication, providing that a feasible way is found to organize and finance the system.

Finally, while general arguments can be made for the educational utilization satellite teleconferencing system, individual States may also have needs for such a system which will be over and above general educational needs. Both Alaska and Hawaii have indicated great interest in educational satellite development and it is possible that these States will prepare special briefs in favor of an educational system developed through federal funding.

A UNESCO-NEA mission to Alaska in 1970 reported:

Satellite communications for Alaska, as part of an overall long-range educational communications system, are not only feasible but necessary for improved communications in the state. In many respects, a satellite was "invented" for Alaska because of Alaska's unique communications problems, lack of terrestrial communication facilities, mountainous terrain, harsh climate and sparse population. These factors point to satellite communication as an ideal system of reaching all parts of the State on a real time basis.⁴¹

For all of the above reasons it seems reasonable to expect that strong arguments will be presented for some sort of accomodation for educational interests on a satellite teleconferencing system. Given the validity of a majority of the arguments in favor of special tariffs for educational interests it is probable that a system configuration should be established that provides for a legal regime that encourages educational innovation and experimentation with the system rather than a series of legal rules and regulations which will stifle creativity in this area.

FOOTNOTES

1. Memorandum, White House to Honorable Dean Burch, Chairman, Federal Communications Commission, 23 January, 1970, at 4.
2. M. Irwin, *The Telecommunications Industry* 107 (1971). He continues:

Do the FCC competitive bid rules apply to all domestic satellite systems - whether space or ground segment, whether carrier or privately owned - and if so, does such a mandate erect an embarrassing gap in equipment procurement policy in general? Indeed, the competitive bid/vertical relationship policy as one policy choice might well be juxtaposed with the in-house procurement practices of the existing domestic carriers. To that extent, the innovation of satellites touches on the conduct and the vertical structure of the domestic carrier industry and goes to the heart of entry and competition in the supply to telecommunication equipment and hardware." Ibid.
3. FCC Proposed CATV Rulemaking, August 15, 1971 (FCC 71-787 63303).
4. "Cable Weighs Heavy at the OTP," Broadcasting 80,25, June 21, 1971. See Also "Whitehead on Access: Cable as Common Carrier," Broadcasting 81,12, Sept. 20, 1971.
5. "Comments of the Joint Council on Educational Telecommunications," Before the FCC, regarding Dkt. No. 18397, at 14.
6. J.M. Pettit and D.J. Grace, "The Stanford Instructional Television Network," IEEE Spectrum 7,5, May 1970, at 78.
7. Ibid.
8. Bernarr Cooper, *ITFS - What it is ... How to Plan*, Washington, D.C., National Education Association, Publication-Sales Section, 1967 at 18.

9. Id. at 14.
10. Id. at 16.
11. Ibid.
12. Id. at 17.
13. Thomas C. Meyer, Richard Hansen, and Roy Rugatz, "Providing Medical Information by Telephone Tapes," Journal of Medical Education, XLV (Dec. 1970), 1060.
14. R. Hansen, Coordinator of Medical Extension, The University of Wisconsin, Interview, October 13, 1971.
15. J. Forbes, Director, Madison Heart Assn., July 8, 1971, and Darryl Reed, Director, Southeast Wisconsin Area Heart Assn., Interview, July 12, 1971.
16. S. Saffian, Director, Campus Assistance Center and Communications, Madison, Interview; See also "Memorandum" to Joe Corry, Assistant Vice-Chancellor for Academic Affairs, by S. Saffian.
17. R. Widoe, Director, Northwestern Wisconsin In-School Television (NEWIST), Green Bay Wisconsin, Aug. 19, 1971.
18. R. Van Able, Director, Instructional Resources, UW-Green Bay, October 13, 1971.
19. Dean J. Smith of the Sheboygan Center, Aug. 20, 1971.
20. R.E. Berigan, Jr., Personnel Supervisor, American Automobile Association, Madison, Sept. 3, 1971.
21. G. Luther, Shift Supervisor, Madison Academic Computing Center, Aug. 26, 1971
- 22.. L. Franks, Director, Wisconsin Educational Communications Board, Madison, Aug. 19, 1971.
23. L.A. Parker, Coordinator of ETN/SCA, University Extension, The University of Wisconsin, July 27, 1971.
- 24.. H. Green, Program Coordinator for SEEN, University Extension, The University of Wisconsin, July 30, 1971.
25. R.S. Way, Program Administrator, Title III, E.S.E.A., State of Wisconsin, Dept. of Public Instruction, Madison, July 21, 1971.
26. Monsignor Schmidt, Director of Milwaukee Archdiocese Communications Center, Milwaukee, October 12, 1971.

27. K. Shuler, Chief Engineer of the Instructional Media Department at Marquette University, Milwaukee, Wisconsin, July 12, 1971.
28. J. Cheski, Assistant Coordinator of the Instructional Media Laboratory at UW-M, June 30, 1971.
29. Dr. S. Close, Director of the Milwaukee Regional Medical Instructional Television Stations, Inc., July 12, 1971.
30. H. Locketz, President, Maxco International, LaCrosse, Wisconsin, July 26, 1971.
31. C. Whitehead, Speech delivered at the International Conference of the Society of Civil Engineers of France, June 7, 1971 entitled "Telecommunications in the Year 2000."
32. U.S. Department of Health, Education and Welfare, "In the Matter of an Inquiry Relating to Preparation for a World Radio Conference of the International Telecommunication Union on Matters Pertaining to the Radio Astronomy and Space Service Before the Commission." Federal Communications Commission, Dkt. No. 18294. Washington, D.C., Sept. 23, 1970, at 10.
33. U.S. Department of State. "Proposals of the United States of America for the World Administrative Radio Conference for Space Telecommunications (Geneva 1971)." Washington D.C., December 1970, at 8-9.
34. See Appendix II for a fuller discussion of activities at the WARC.
35. Hearings Before the Subcommittee on Communications of the Senate Commerce Committee, 90th Cong. 1st Sess., ser. 90-4, at 484 (1967).
36. Comments of the Corporation for Public Broadcasting and the Public Broadcasting Service in Response to the Commission's Report and Order of March 20, 1970, in the Above-entitled Matter - Establishment of Domestic Communication Satellite Facilities by non-government entities; Dkt. No. 16495, Before the Federal Communications Commission, May 12, 1971 at 23-36.
37. Letter from C.R. Carpenter, President, Joint Council on Educational Telecommunications to Dr. Clay T. Whitehead, Staff Assistant to the President, Oct. 9, 1969, at 1.

38. Letter from Frank W. Norwood, Executive Secretary, Joint Council on Educational Telecommunications to Dr. Clay T. Whitehead, Staff Assistant to the President, September 19, 1969, at 2.
39. Comments of the Joint Council on Educational Telecommunications, in the matter of the Establishment of domestic non-common carrier communication satellite facilities by non-governmental entities, Dkt. No. 16495, Before the Federal Communications Commission, Dec. 16, 1966 at 17.
40. Comments of the Joint Council on Educational Telecommunications, in the matter of the Establishment of Domestic Communication Satellite Facilities by non-government Entities; Dkt. No. 16495, Before the Federal Communications Commission, May 12, 1971, at 7.
41. H.R. Cassirer, H. Wigren, "Alaska: Implications of Satellite Communication for Education," UNESCO, ser. No. 2198/BMS. RD/MC, Paris, Nov. 1970, at 2.

AN OWNERSHIP AND MANAGEMENT MODEL

If a dedicated satellite teleconferencing system is to be developed which has a large segment of its activities devoted to educational and public service programming, there will be a need for some organizational form for ownership and management. It may prove necessary to develop a private corporation to own and manage the system or it may prove desirable to establish a non-profit entity. A joint venture between commercial and non-commercial interests is possible, or parallel systems could be developed. The major corporate model that is available is the Communications Satellite Corporation.

COMSAT: The Communications Satellite Corporation

The initial domestic legislation towards the end of establishing a commercial communications satellite system was enacted in the United States in 1962 and was entitled the Communications Satellite Act.¹ The purpose of the Act was

to establish, in conjunction and in cooperation with other countries, as expeditiously as practicable, a commercial communications satellite system, as part of an improved global communications network, which will be responsive to public needs and national objectives, which will serve the communication needs of the United States and other countries, and which will contribute to world peace and understanding.²

Through the creation of the Communications Satellite Corporation (Comsat),³ a private entity (but with strict governmental supervision), which was empowered to "plan, initiate, construct, own, manage, and operate itself or in conjunction with foreign governments or business entities a commercial communications satellite system,"⁴ it was hoped to further international collaboration in a global system. The policy decision to make United States participation in a global system take the form of a private corporation subject to appropriate governmental regulation created internal difficulties,⁵ most of which were resolved in due course in the interests of securing early agreement on an international system.

For purposes of analysis, the basic structure of Comsat is that of a private corporation governed by the District of Columbia Business Corporation Act⁶ which is nevertheless subject to regulation and control by the President, the National Aeronautics and Space Administration, and the Federal Communications Commission. It is also required to make detailed yearly reports of its operations to Congress and the President. One half of the stock of the Corporation is held by U.S. communication carriers and the other half is held by the public with limitations on individual holdings. There are fifteen members on the Board of Directors, with three being appointed by the President

with the approval of the Senate, six being elected by the common carriers and six being elected by the public stockholders. The declaration of policy embodied in Section 102(a) of the Act is particularly significant:

In order to facilitate this development and to provide the widest possible participation by private enterprise, United States participation in the global system shall be in the form of a private corporation, subject to appropriate governmental regulation. It is the intent of Congress that all authorized users shall have nondiscriminatory access to the system; that maximum competition be maintained in the provision of equipment and services utilized by the system; that the corporation created under this Act be so organized and operated as to maintain and strengthen competition in the provision of communications services to the public; and that the activities of the corporation created under this Act and of the persons or companies participating in the ownership of the corporation shall be consistent with the Federal antitrust laws.⁷

Within this general statement of policy the President, NASA, and the FCC exercise specific functions with relation to the Corporation. Following are the enumerations of these duties. The President is empowered to:

- (1) aid in the planning and development and foster the execution of a national program for the establishment and operations, as expeditiously as possible, of a commercial communications satellite system;
- (2) provide for continuous review of all phases of the development and operation of such a system, including the activities of a communications satellite corporation authorized under title III of this Act;
- (3) coordinate the activities of governmental agencies with responsibilities in the field of telecommunication, so as to insure that there is full and effective compliance at all times with the policies set forth in this Act;

(4) exercise such supervision over relationships of the corporation with foreign governments or entities or with international bodies as may be appropriate to assure that such relationships shall be consistent with the national interest and foreign policy of the United States;

(5) insure that timely arrangements are made under which there can be foreign participation in the establishment and use of a communications satellite system;

(6) take all necessary steps to insure the availability and appropriate utilization of the communications satellite system for general governmental purposes except where a separate communications satellite system is required to meet unique governmental needs, or is otherwise required in the national interest; and

(7) so exercise his authority as to help attain coordinated and efficient use of the electromagnetic spectrum and the technical compatibility of the system with existing communications facilities both in the United States and abroad.⁸

The National Aeronautics and Space Administration shall:

(1) advise the Commission on technical characteristics of the communications satellite system;

(2) cooperate with the corporation in research and development to the extent deemed appropriate by the Administration in the public interest;

(3) assist the corporation in the conduct of its research and development program by furnishing to the corporation, when requested, on a reimbursable basis, such satellite launching and associated services as the Administration deems necessary for the most expeditious and economical development of the communications satellite system;

(4) consult with the corporation with respect to the technical characteristics of the communications satellite system;

(5) furnish to the corporation, on request and on a reimbursable basis, satellite launching and associated services required for the establishment, operation,

and maintenance of the communications satellite system approved by the Commission; and

(6) to the extent feasible, furnish other services, on a reimbursable basis, to the corporation in connection with the establishment and operation of the system.⁹

Finally, the Federal Communications Commission shall:

(1) insure effective competition, including the use of competitive bidding where appropriate, in the procurement by the corporation and communications common carriers of apparatus, equipment, and services required for the establishment and operation of the communications satellite system and satellite terminal stations; and the Commission shall consult with the Small Business Administration and solicit its recommendations on measures and procedures which will insure that small business concerns are given an equitable opportunity to share in the procurement program of the corporation for property and services, including but not limited to research, development, construction, maintenance and repair.

(2) insure that all present and future authorized carriers shall have nondiscriminatory use of, and equitable access to, the communications satellite system and satellite terminal stations under just and reasonable charges, classifications, practices, regulations, and other terms and conditions and regulate the manner in which available facilities of the system and stations are allocated among such users thereof;

(3) in any case where the Secretary of State, after obtaining the advice of the Administration as to technical feasibility, has advised that commercial communication to a particular foreign point by means of the communications satellite system and satellite terminal stations should be established in the national interest, institute forthwith appropriate proceedings under section 214(d) of the Communications Act of 1934, as amended, to require the establishment of such communication by the corporation and the appropriate common carrier or carriers;

(4) insure that facilities of the communications satellite system and satellite terminal stations are technically compatible and interconnected operationally with each other and with existing communications facilities;

(5) prescribe such accounting regulations and systems and engage in such ratemaking procedures as will insure that any economies made possible by a communications satellite system are appropriately reflected in rates for public communication services;

(6) approve technical characteristics of the operational communications satellite system to be employed by the corporation and of the satellite terminal stations;

(7) grant appropriate authorizations for the construction and operation of each satellite terminal station, either to the corporation or to one or more authorized carriers or to the corporation and one or more such carriers jointly, as will best serve the public interest, convenience, and necessity. In determining the public interest, convenience, and necessity the Commission shall authorize the construction and operation of such stations by communications common carriers or the corporation, without preference to either;

(8) authorize the corporation to issue any shares of capital stock, except the initial issue of capital stock referred to in section 304(a), or to borrow any moneys, or to assume any obligation in respect of the securities of any other person, upon a finding that such issuance, borrowing, or assumption is compatible with the public interest, convenience, and necessity and is necessary or appropriate for or consistent with carrying out the purposes and objectives of this Act by the corporation;

(9) insure that no substantial additions are made by the corporation or carriers with respect to facilities of the system or satellite terminal stations unless such additions are required by the public interest, convenience, and necessity;

(10) require, in accordance with the procedural requirements of section 214 of the Communications Act of 1934, as amended, that additions be made by the corporation or carriers with respect to facilities of the system or satellite terminal stations where such additions would serve the public interest, convenience, and necessity; and

(11) make rules and regulations to carry out the provisions of this Act.¹⁰

In addition to the regulatory activities of the President, NASA, and the FCC, the Corporation is also deemed to be a common carrier within the meaning of section 3(h) of the Communications Act of 1934 and is fully subject to the provisions of title II and title III of the Act.¹¹

Within the above boundaries the Corporation is authorized to:

(1) plan, initiate, construct, own, manage, and operate itself or in conjunction with foreign governments or business entities a commercial communications satellite system;

(2) furnish, for hire, channels of communication to United States communications common carriers and to other authorized entities, foreign and domestic; and

(3) own and operate satellite terminal stations when licensed by the Commission under section 201(c) (7).

(b) Included in the activities authorized to the corporation for accomplishment of the purposes indicated in subsection (a) of this section, are, among others not specifically named -

(1) to conduct or contract for research and development related to its mission;

(2) to acquire the physical facilities, equipment and devices necessary to its operations, including communications satellites and associated equipment and facilities, whether by construction, purchase, or gift;

(3) to purchase satellite launching and related services from the United States Government;

(4) to contract with authorized users, including the United States Government, for the services of the communications satellite system; and

(5) to develop plans for the technical specifications of all elements of the communications satellite system.

(c) To carry out the foregoing purposes, the corporation shall have the usual powers conferred upon a stock corporation by the District of Columbia Business Corporation Act.¹²

The FCC standard of "public interest, convenience, and necessity" should also be included as a general regulatory norm.

All of the above Comsat provisions can be used as a model of what the development of a special corporation for a satellite teleconferencing organization should approximate. The division of responsibilities between the President, NASA and the FCC could be applied with certain modifications. It might also be possible, based on the experience of Comsat, to more clearly define the limits and coordination of regulatory responsibility. If demonstration projects are undertaken to substantiate the value of a satellite teleconferencing system, the various legal problems that might arise could be considered and several specific alternatives for a management structure could be promulgated. These could then be tested against the responses and determinations made by the President, NASA and the FCC as to the regulatory

regime to be developed. The results of this exercise could then be the development of a draft corporate charter which could be revised and altered to coincide with technological reality and the requirements of the political and legal branches of government. In this way the optimum satellite teleconferencing system could be developed.

FOOTNOTES

1. Communications Satellite Act, 47 U.S.C. Sec. 701 (1962): For the legislative history of the Act, see Senate Report No. 1584, June 11, 1962; Senate Report no. 1873, Aug. 10, 1962; and House Report No. 1636, April 24, 1962. See also, Statement of the President on Communication Satellite Policy, Office of the White House Press Secretary, July 24, 1961, which contained President Kennedy's formulation of American national policy on satellite communication: Further analysis can be found in: Moulton, "Communication Satellites-- the Proposed Communication Satellite Act of 1962," 18 Bus. Law 173, 174-5 (1962); Note, "The Communications Satellite Act of 1962," 76 Harv. L. Rev. 38 (1962); Moulton, "Some Legal Aspects of International Communications" 41 N.C. L. Rev. 354 (1963); Segal, "Communications Satellites - Progress and the Road Ahead" 17 Vand. L. Rev. 677, 683-7 (1964); Levin, "Organization and Control of Communications Satellites" 113 U. Pa. L. Rev. 315 (1965); Moulton, "Commercial Space Communications" 73 in H. Taubenfeld (ed.) Space and Society (1964); A. Haley, Space Law and Government 188-205 (1963). See Appendix v for the Comsat legislation.
2. Comm. Sat. Act. Sec. 102(a). Sec. 102(b) continued by stating that developing countries should be aided, that the most economical use be made of the frequency spectrum, and that the lowest possible rates be applied to the services. Sec. 102(c) provided for nondiscriminatory access for all authorized users, the maintenance of procurement competition and service offering competition, and compliance with Federal antitrust laws. Sec. 102(d) left open the possibility for a domestic satellite system, or "the creation of additional communications satellite systems, if required to meet unique governmental needs or if otherwise required in the national interest." See also Sec. 201(a) (6). Two problem areas developed as a result of Sec. 102(d): one concerned the development of a military communications satellite program, and the other concerned the organizational arrangements to be made for a domestic communications satellite program.
3. Comm. Sat. Act, Sec. 301. Secs. 302 through 304 provide for the process of organization, the directors and officers, and the financing of the corporation.

4. Comm. Sat. Act Sec. 305(a) (1). It was also authorized to
 - "(2) furnish, for hire, channels of communication to United States communications common carriers and to other authorized entities, foreign and domestic; and
 - (3) own and operate satellite terminal stations when licensed by the Commission."

Sec. 305(b) listed a partial list of activities that the corporation could undertake in furtherance of its objectives. For a discussion of the conflicts of interest within Comsat and an evaluation of the Second Earth Station and Authorized User decisions, See Schwartz, "Comsat, the Carriers, and the Earth Stations: Some Problems with 'Melding Variegated Interests'", 76 Yale L. J. 441 (1967).

5. Questions were raised as to the relative bargaining power of Comsat vis a vis European governmental telecommunication agencies, and to the possibility of merging the facilities of the American carriers to provide for the most efficient use of the hardware and to offset high fixed costs where the unit cost decreases with the increasing use of plant. A suggestion has been made for the enactment of permissive merger legislation to allow for any desirable restructuring which the F.C.C. finds to be in the public interest. Report and Recommendations to the Senate and House Commerce Committees, Submitted by the Intra-Governmental Committee on International Telecommunications, April 29, 1966: The Wall Street Journal, May 31, 1966, p28, col. 1.
6. Comsat Act supra note 1 at Sec. 301.
7. Id. at Sec. 102(c).
8. Id. at Sec. 201(a).
9. Id. at Sec. 201(b).
10. Id. at Sec. 201(c).
11. Id. at Sec. 401.
12. Id. at Sec. 305.

APPENDIX I

SUMMARY AND EXCERPT FROM THE FCC
LETTER OF INTENT ON CATV

The Federal Communications Commission has proposed cable television regulations, which could possibly go into effect by 1 March 1972. These regulations are divided into four main areas: broadcast signal carriage, non-broadcast channel access, technical standards, and federal-state-local relationships. Broadcasting Magazine, 9 August 1971, has summarized the proposed regulations in the following manner:

Television broadcast signal carriage

The rules "would divide all signals into three classifications: (1) mandatory carriage--signals that a cable system must carry; (2) minimum service--a minimum number of signals that, taking television market size into account, a cable system may carry; (3) additional service--signals that some systems may carry in addition to those required or permitted in the two above categories.

"It is necessary to establish the frame of reference within which the rules would operate. First...the rules would vary according to whether a cable system is within the top-50 television markets, in markets 51-100, in a market below 100, or not in a television market at all.... Second... the area within each market to which the particular rules will be applicable [is] a zone of 35 miles radius surrounding a specified reference point in each designated community in the market."

Mandatory carriage. "Two changes are to be made in the existing (grade B) carriage rule. The first is a requirement that all cable system must carry the signals of all stations licensed to communities within 35 miles of the cable system's community.... An out-of-market network affiliate would be considered to be significantly viewed if it obtains at least a 3% share of the television homes in the community and has a net weekly circulation in

the community of 25% or more. For independent stations, the test of significant viewing would be a 1% share of viewing hours and a net weekly circulation of at least 5%."

Minimum carriage. Minimum service standards would be as follows: "(1) in television markets 1-50: three full network stations, three independent stations; (2) in markets 51-100: three full network stations, two independent stations; (3) in smaller television markets (below 100): three full network stations, one independent station. If...minimum service is still not being supplied, distant signals would be permitted to be carried as needed to make up the defined minimum of service."

Additional service. "Cable systems in the top-100 markets would in any case be permitted to carry two signals beyond those whose carriage would be required under the mandatory carriage rules. Distant and out-of-market signals carried to provide minimum service would be counted against these additional signals so that if, for example, two distant signals were carried to provide minimum service, no additional signals could be carried. Cable systems in smaller markets (below 100) would not be permitted to import network or independent television signals beyond the minimum service level...."

Leapfrogging. The commission would adopt a new rule⁴ requiring cable systems in the top-100 markets carrying distant independent television stations to carry, as a first priority, one UHF independent station from within 200 miles. If there is no such UHF station, any VHF station within 200 miles or any UHF station could be carried. The second distant signal in these top-100 markets would be free from restrictions as to point of origin...."

Educational and foreign language stations. "We will allow a cable system to carry any number of educational signals, local or distant, in the absence of objection.... We would [also] permit cable systems to import non-English language programming [and] would not count against the quotas discussed previously the distant signal of a non-English language station when carrying these programs."

Sports. The FCC will issue rules to prevent cables from circumventing local blackouts of home games by importing distant signals. As a general rule, however, "Cable systems will be able to carry whatever sports events are carried locally--including those meeting the 'significant viewing' test.... We are not unmindful of the possibility that a nationwide interconnected cable network...could remove sports programming from conventional broadcast television.... It may be...that legislation may be the ultimate answer...."

Grandfathering. "Cable systems already in operation on the effective date of the rules would be permitted to continue operation and to provide the existing line-up of signals without regard to the new requirements of signal carriage if that service had been previously grandfathered...or if the service were commenced in compliance with the rules after Dec. 20, 1968, and was then consistent with the rules proposed."

Nonbroadcast channels (access)

All systems in the top-100 markets would be subject to the following:

Channel capacity. "We will not immediately require a channel capacity in any except the top-100 markets. In those markets we believe a 20-channel capacity (actual or potential) is the minimum consistent with the public interest. We will also adopt a rule that for each broadcast signal carried, cable systems must provide equivalent bandwidth for nonbroadcast uses."

Public access, educational and government channels. "We will require that there be one free, dedicated, noncommercial, public-access channel available at all times on a nondiscriminatory basis. In addition, we will require that one channel be set aside for educational use and one channel for state and local government use on a developmental basis and that, upon completion of the basic trunk line, for the first five years thereafter these channels will be made available free.... A systems operator will be required to provide only use of the cable channel on a free basis; production costs (aside from brief live studio presentations not exceeding five minutes in duration) may be charged to users."

Leased channels. "After cable systems have satisfied the [above] priority, they may make available for leased uses the remainder of the required bandwidth and any other available bandwidth.... Indeed, to the extent that the public-access, educational and governmental channels are not being used, these channels may also be used for leased operation. But such operations may only be undertaken with the express understanding that they are subject to immediate displacement if there is a demand to use the channel for the dedicated purpose."

Expansion of capacity. "Cable systems will be required to make an additional channel available for use as the demand arises.... Initially...we propose to use the following factor to determine when a new channel must become operational: Whenever all operational channels are in consistent use during 80% of the weekdays (Monday-Friday), for 80% of the time during any three-hour period for six weeks running, the system will then have six months in which to make a new channel available. Such an $N + 1$ [existing number of channels plus one to be built] availability should encourage use of the channels, with the knowledge that the channel space will always be

available, and also encourage the cable operator continually to expand and update his system.... Inasmuch as this area of regulation is new, we will re-examine the N + 1 concept at an early time if unexpected problems develop."

Two-way capacity. "We have decided to require that there be built into cable systems the capacity for two-way communication. This is apparently now feasible at a not inordinate additional cost, and its availability is essential for many of cable's public services."

Regulation of nonbroadcast programming. "We believe that such regulation is properly the concern of this commission.... We think that in this area this dual form of regulation [federal and local] would be confusing and impracticable.... Thus, we believe that, except for the government channel, local regulation of access channels carrying programming is precluded, at least at this time.... Similarly, aside from channels for government uses, we do not believe that local entities should be permitted to require that other channels be assigned for particular uses.

"...The rules...must specify nondiscriminatory access on a first-come, first-served basis during this interim period...[and] the cable operator must not censor or exercise program control of any kind over the material presented on the public-access channel. However, his rules shall proscribe the presentation of any advertising material (including political advertising spots), of lotteries, and...of obscene or indecent matter."

Production facilities. "We will require that the cable operator maintain at least minimal production facilities for public use within the franchise area."

Technical standards

For the present, the commission will apply standards only to television

broadcast signals, not to newer services, to "assure the subscriber at least a minimum standard of reception quality, while at the same time permitting the continuation of technical experimentation."

Federal-state/local relationships

"We agree with the contention that federal licensing at this time would place an unmanageable administrative burden on the commission. Accordingly, we will not now take that step. Furthermore, local governments are markedly involved.... But [we] will take steps to insure efficient nationwide communications service with adequate facilities at reasonable charges...by specifying minimum requirements in the local franchising process."

Basic qualifications--choice of franchisee and service area. "We will require that the cable system, before commencing operation with broadcast signals, file a copy of its franchise with us and a certificate showing that the franchising authority in a public proceeding has considered the system operator's legal and financial qualifications, and the adequacy and feasibility of his construction arrangements."

Construction timetable--franchise duration. "(T)o ensure that franchises do not lie fallow or become the object of trafficking...we will provide that the franchise require that the cable system have an operable headend within one year after this commission grants a certificate of compliance, and that thereafter it meet substantial percentage figures for extension of energized trunk cable, such figures to be set by the local authority.... We will require the franchising authority to place a reasonable limit on the duration of the franchise, and its renewal. We think that...as a general guide...a franchise should not exceed 15 years."

Significant portions of the proposed regulations are presented here:

II. Non-Broadcast Channels (Access)

In our July 1, 1970 Notice of Proposed Rule Making in Docket 18397-A, we stated:

The structure and operation of our system of radio and television broadcasting affects, among other things, the sense of "community" of those within the signal area of the station involved. Recently governmental programs have been directed toward increasing citizen involvement in community affairs. Cable television has the potential to be a vehicle for much needed community expression.

Confronted with the need for more channels available for community expression on the one hand and, on the other, with the promised emergence of cable television's capacity to provide an abundance of such channels, we stated in our July 1, 1970 Notice the principle that the Commission". . . must make an effort to ensure the development of sufficient channel availability on all new CATV systems to serve specific recognized functions." We will seek to serve these purposes through a number of interrelated requirements spelled out in the following discussion.

We will tailor our actions to take into account the public interest considerations stemming from possible impact of cable on broadcast services. We recognize that in any matter involving future projections, there are necessarily some risks. As we have also stated, what makes those risks so clearly worth taking is the chance of obtaining great benefits to the public from cable's new services. It follows that

along with making distant or overlapping signals available for the first time in specified markets, we should act to require a bandwidth that will ensure the availability of these new services. Otherwise, some cable operators might construct systems adequate only to the carriage of broadcast signals, or might long postpone the availability of non-broadcast channels. We believe this would be a most unwise decision, since the use of non-broadcast bandwidth is of high public promise and can be profitable to the cable owner. Indeed, it may be the critical factor making for cable's success. The public interest, as well as the cable industry's economic interest, may well be found in reducing subscriber fees and relying proportionately more for revenue on the income from channel leasing. In sum, we emphasize that the cable operator cannot accept the distant or overlapping signals that will be made available without also accepting the obligation to provide for substantial non-broadcast bandwidth. The two are integrally linked in the public interest judgment we have made.

Channel Capacity (Bandwidth)

We envision a future for cable in which the principal services, channel uses, and potential sources of income will be other than over-the-air signals. We note that 40, 50, and 60 channel systems are currently being installed. The cost difference between installing 12 and 20 channel capacity would not appear to be substantial. We urge cable operators to consider that future demand may significantly exceed current projections, and we put them on notice that it is our intention to insist on the expansion of cable systems to accommodate all reasonable demand.

At the same time, we do not want to impose unreasonable economic burdens on cable operators. Accordingly, we will not immediately require a minimum channel capacity in any except the top 100 markets. In those markets we believe a 20 channel capacity (actual or potential) is the minimum consistent with the public interest.

We will also adopt a rule that for each broadcast signal carried, cable systems must provide equivalent bandwidth for non-broadcast uses. This seems a reasonable way to obtain the necessary minimum channel capacity and yet gear it to particular community needs. Finally, the "N + 1" availability concept, discussed below, is also pertinent to the question of channel capacity.

Public Access, Educational, and Government Channels

Broadcast signals are being used as a crucial component in the establishment of cable systems, and it therefore seems appropriate that certain basic goals of the Communications Act be furthered by cable's advent--the opening up of new outlets for local expression, the promotion of added diversity in television programming, the advancement of educational and instructional television, and the increased information services of local governments. Accordingly, we will require that there be one free, dedicated, non-commercial, public access channel available at all times on a non-discriminatory basis. In addition, we will require that one channel be set aside for educational use and one channel for state and local government use on a developmental basis and that, upon completion of the basic trunk line, for the first five years thereafter these two channels will be made available free. After this developmental phase--designed to encourage sophisticated educational and governmental

innovation in the use of local television--we will then be in a more informed position to determine, in consultation with state and local authorities, whether to expand or curtail the free use of channels for such purposes or, indeed, whether we should continue the developmental period for a further time. We do not want the free uses described above to constitute an unreasonable economic burden on cable system operators and subscribers. Therefore, a system operator will be obliged to provide only use of the cable channel on a free basis; production costs (aside from brief live studio presentations not exceeding five minutes in duration) may be charged to users.

Leased Channels

After cable systems have satisfied the priority of providing one free public access channel as well as the free developmental channels for education and government, they may make available for leased uses the remainder of the required bandwidth and any other available bandwidth (e.g., if a channel carrying broadcast programming is blacked out because of our non-duplication requirement or is otherwise not in use, that channel also may be used for leased programming). Indeed, to the extent that the public access, educational, and governmental channels are not being used, these channels may also be used for leased operation. But such operations may only be undertaken with the express understanding that they are subject to immediate displacement if there is a demand to use the channel for the dedicated purpose.

Expansion of Capacity

Our basic goal is to encourage experimentation that will lead to constantly expanding channel capacity. Cable systems will therefore

be required to make an additional channel available for use as the demand arises.

There are many ways of administering this general goal. Experience will be valuable to users, systems, and the Commission alike. Initially, however, we propose to use the following factor to determine when a new channel must become operational: Whenever all operational channels are in consistent use during 80% of the weekdays (Monday-Friday), for 80% of the time during any three-hour period for six weeks running. The system will then have six months in which to make a new channel available. Such an N + 1 availability should encourage use of the channels, with the knowledge that channel space will always be available, and also encourage the cable operator continually to expand and update his system. We contemplate that at least one of the leased channels will give priority to part-time users; the remaining leased channel capacity may be used by full-time lessees.

As mentioned above, we are aware of the risks inherent in the N + 1 formula. A cable owner has an obvious economic incentive to devote his bandwidth to profitable channel leasing activities, and might thus be motivated to restrict use of the access channels to avoid triggering the N + 1 availability. A whole variety of techniques might, quite obviously, be employed. While it would not appear to constitute any problem in the immediate future, we intend to institute now a proceeding to assure that the N + 1 concept is not frustrated at some later date through rate manipulation; this proceeding will deal with appropriate future regulatory policies as to the rates charged for these leased channel operations for interstate services. We are also aware that the formula may be too rigorous and impose economic burdens on operators.

The six-month period allowed for activation of new channels, for example, contemplates the relatively modest effort needed to convert existing potential capacity into actual capacity. Obviously, if it were necessary to rebuild or add extensive new plant, this could not reasonably be expected within any six-month period. The latter consideration again points up the necessity of building now with a potential that takes the future into account. In the new proceeding referred to above, we will also explore this aspect of possible rebuilding or extensive new construction that might be required under our rules. In sum, we adopt the 80% figure only as a general formula. Inasmuch as this area of regulation is new, we will reexamine the N + 1 concept at an early time if unanticipated problems develop.

Two-Way Capacity

After studying the comments received and our own engineering estimates, we have decided to require that there be built into cable systems the capacity for two-way communication. This is apparently now feasible at a not inordinate additional cost, and its availability is essential for many of cable's public services. Such two-way communication, even if rudimentary in nature, can be useful in a host of ways -- for surveys, marketing services, burglar alarm devices, educational feed-back, to name a few. Of course, viewers should also have a capability enabling them to choose whether or not the feed-back is activated.

Regulations Applicable to Public Access, Educational, Government, and Leased Channels Presenting Non-Broadcast Programming

Having provided for these access channels, we turn to the question of the regulation of the public access and other channels presenting non-broadcast programming. First, we believe that such regulation

is properly the concern of this Commission. This is so not just because we have required the creation of such channels and specified their initial or continuing priority. As stated, the channels are designed to fulfill Communications Act purposes and are integrally bound up with the broadcast signals being carried over the system. It is by no means clear that the viewing public will be able to distinguish between a broadcast program and an access program; rather, the subscriber will simply flick across the dial from broadcast channels to public access or leased channel programming, much as he now selects television fare. Further, the leased channels will undoubtedly involve interconnected programming, via satellite or interstate terrestrial facilities, matters that are within the Commission's jurisdiction. Similarly, it is this Commission that must make the decisions as to conditions to be imposed on the operation of pay channels, and we have already taken steps in that direction. (See Section 74.1121.)

Federal regulation is thus clearly called for. The issue is whether also to permit local regulation of these channels, if not inconsistent with Federal purposes. We think that in this area this dual form of regulation would be confusing and impracticable.

Further, we do not believe that the purposes we seek to advance would be served by detailed regulations at this time; rather as set forth more fully below, we think it is important to allow a period of considerable experimentation. Thus, we believe that, except for the government channel, local regulation of access channels carrying programming is precluded, at least at this time. We stress that if experience and considerations

brought forth in the further proceeding indicate the need or desirability therefor, we can then delineate an appropriate local role.

Similarly, aside from channels for government uses, we do not believe that local entities should be permitted to require that other channels be assigned for particular uses. As stated above, this in our view is peculiarly a matter of federal concern. We stress again that we are entering into an experimental or developmental period. Thus, where the cable operator and the franchising authority seek to experiment by providing additional channel capacity for such purposes as public access, educational, and governmental--on a free basis or at reduced charges--we will entertain petitions and consider the appropriateness of authorizing such experiments, to gain further data and insight and to guide future courses of action. For the same reasons, we will permit existing systems to continue operating under more "generous" specifications than those described in this section.

The question of what regulations we should impose at this time is a most difficult one. We simply do not know how these services will evolve. The comments received, while helpful and well-intentioned, understandably could not now supply definitive standards. We believe that our best course is to facilitate use of these channels on a first-come, first-served nondiscriminatory basis with only the most minimal regulations, in order to obtain experience, and on the basis of that experience and the comments received in a new proceeding, to lay down more specific regulations. We stress, therefore, that the regulatory pattern here described is interim in nature--that we may make minor or indeed major changes as we

gain the necessary insight.

Turning to our interim rules, we are guided by two main policy considerations: (1) to allow maximum experimentation and (2) to prevent, particularly during this critical early period and probably at all times, one entity sitting astride all this channel capacity and deciding what programming should or should not enter subscriber homes.

We will authorize the commencement of cable service and, with that commencement, require the offering of these services. We will further require that, in accordance with our regulations, the cable system promulgate rules to apply to these services, and will require that the rules be kept on public file at the system's headquarters and with the Commission. What matters during this experimental period is not form but substance, and we will lay down the substantive guides that we believe are appropriate at this time. We believe that we have full discretion to act in this fashion. See Philadelphia Television Broadcasting Co. v. F.C.C., 123 U.S. App. D.C. 298, 359 F. 2d 282 (1966).

With respect to the public access channel, the rules to be promulgated by the system must specify nondiscriminatory access on a first-come, first-served basis during this interim period. It also follows that, during this interim period, the cable operator must not censor or exercise program content control of any kind over the material presented on the public access channel. However, his rules shall proscribe the presentation of any advertising material (including political advertising spots), of lotteries, and, in terms identical to 18 U.S.C. § 1464, of

obscene or indecent matter. The regulations shall also specify that persons or groups seeking access be identified, and their addresses obtained; these are reasonable requirements, and this information should be publicly available.

We do not envision any other proscriptions during this experimental period. We recognize that open access carries with it certain risks. But some amount of risk is inherent in a democracy committed to fostering "uninhibited, robust, and wide-open" debate on public issues. (New York Times Co. v. Sullivan, 376 U.S. 254, 270 (1964)). In any event, further regulation in this sensitive area should await experience and the outcome of the proceeding we expect to initiate. For example, we intend to explore whether it would be feasible or desirable to provide subscribers a locked switch to cut off the public access or leased channels, should parents wish to control their children's viewing.

In short, we recognize that the public access channel requirements may result in many problems for the cable operator, especially during the break-in period. Effective operational procedures can evolve only from trial and error, and it is probable that different systems will have diverse problems not presently capable of being solved by uniform regulation. We note, for example, the need to decide how applications for access time shall be made, who must make them, what overall time limitations might be desirable, how copyrighted material will be protected, how production facilities will be provided, how the public can get some advance notice of what is to be presented, and so on. All these questions will probably be answered by cable systems in a number of

different ways. Again, we will require that the rules adopted by cable systems in these respects be filed with us and made available to the public. But experimentation appears to be the best way to determine what will be workable for the long run. Only with experience will we be able to tell what further general rules, if any, are called for.

The cable operator, except for channels programmed by the system itself, similarly must not censor or exercise program content control of any kind over the material presented on the leased channels. Specifically, his rules shall provide for nondiscriminatory access on a first-come, first-served basis with the appropriate rate schedule specified. Again, he shall obtain the names and addresses of the persons or groups seeking access, and shall adopt rules proscribing the presentation of obscene or indecent matter (in the precise terms of 18 U.S.C. § 1464), lotteries, and advertising material not containing the necessary commercial identification. Finally, in contrast with existing cablecasting rules (Section 74.1117), we will not require commercials only at natural breaks on these channels. It is our expectation that there will be experimentation in this respect, with some channels used entirely for advertising, some following the pattern of present commercial broadcasts, and others that of Section 74.1117. We do not wish to inhibit in any way the presentation of new materials over these channels during this critical introductory period. Again, we leave to the rule making proceeding such questions as dealing with false and misleading advertising, some possible modified fairness or personal attack requirements, and the like.

Liability

Many cable operators are concerned about potential civil and criminal liability resulting from use of these public access and leased

channels. There is little if any possibility of a criminal suit in a situation where the system has no right of control and thus no specific intent to violate the law. See, e.g., Baird v. Arizona State Bar, 401 U.S. 1 (1971); In Re Stolar, 401 U.S. 23 (1971); Law Students Civil Rights Research Council v. Wadmond, 401 U.S. 154 (1971); Yates v. United States, 354 U.S. 298 (1957).

The cable operator's real fears seem, in fact, to center mainly around potential libel suits. The possible number and scope of such actions is, however, severely limited. In Rosenbloom v. Metromedia, Inc., 39 U.S.L.W. 4694 (1971), the Court extended the "actual malice" rule of New York Times Co. v Sullivan, *supra.*, to cover any situation where "the utterance involved concerns a matter of public or general interest." Since most users will presumably air opinions on matters that are of at least as much "public or general interest" as in the Rosenbloom case, it seems likely that their speech would come within the "actual malice" rule. No such malice could be imputed to a cable operator who had no control over the given program's content.

In the unlikely event that some material presented on these non-broadcast channels were to fall outside the broad scope of the Court's recent decisions such as Rosenbloom, this would not necessarily mean that the system is liable. (Of course, the programmer would remain fully liable.) We have adopted the no-censorship requirement in order to promote "robust, wide-open debate" and for the policy reasons set out above; these are, we believe, valid regulations having "the force of law." While the matter is of course one for resolution by the courts

(as also would be the due process issues raised), we suggest that state law imposing liability on a system that has no control over these channels would frustrate federal purposes. In any event, if any problem should develop in this respect, it is readily remedied by Congress and, in this connection, we would welcome clarifying legislation. Cf. Farmers Educational and Cooperative Union v. WDAY, 360 U.S. 525 (1959).

Production Facilities

It is obvious that our goal of creating a low-cost, nondiscriminatory means of channel access cannot be attained unless members of the public have available some reasonable production facilities. We expect that many cable systems will have facilities with which to originate programming, and such facilities should also be available to produce program material for public access. Hopefully, colleges and universities, high schools, recreation departments, churches, unions, and other community sources will have low-cost video-taping equipment available to the public. Whatever sources are available, however, we will require that the cable operator maintain at least minimal production facilities for public use within the franchise area.

In this experimental stage, when cablecasting material may well come from diverse sources, it could be self-defeating to require a cable operator to carry this material and at the same time to meet stringent technical standards. We note specifically that the use of half-inch video tape is a growing and hopeful indication that low-cost video tape recording equipment can and will be made available to the public. While such equipment does not now meet our technical standards for broadcasting, the

prospects for its improvement and refinement are excellent. Further, since it provides an inexpensive means of program production, we see no reason why its development should not be encouraged for use on cable channels.

Many elaborate suggestions have been made for comprehensive community control plans such as neighborhood origination centers, mobile communications vehicles, and neighborhood councils to oversee access channels. Here again the Commission will encourage experimentation rather than trying to enforce a more formal structure at this time.

Applicability

These access rules will be applicable to all new systems that become operational in the top 100 markets (as defined in Section I above). Currently operating systems in the top 100 markets would have five years to comply with this section. Existing systems in markets below the top 100 would be required to meet these access rules when and as the system is substantially rebuilt.

Our reasons for focusing on the top 100 markets may be briefly stated. We have delineated these markets (within 35 mile zones) as the recipients of special benefits in order to stimulate cable growth. But, correspondingly, that growth should be accompanied by these access requirements or the public will not fully receive the benefits we seek. To the extent that this may pose some problems for systems operating in relatively small communities in these markets, such systems are free to meet their obligations through joint building and related programs with cable operators in the larger core areas.

Finally, if these requirements should impose an undue burden on some isolated system, that is a matter that can be dealt with in a waiver request, with an appropriate detailed showing.

IV: Federal-State/Local Relationships

In the Notice of Proposed Rule Making in Docket No. 18892, 25 FCC 2d 50 (1970), we stated that we favored federal regulation of some aspects of cable television and local--i.e., state or municipal--regulation of others under a federal prescription of standards. The comments generally agreed that certain areas of cable regulation can best be dealt with at the federal level because states and municipalities lack the necessary resources for effective regulation. We are also persuaded that, absent affirmative Commission action, state and local bodies would be free in other areas of regulation to stifle cable growth in a manner at odds with the Commission's nationwide regulatory plan. Accordingly, it is our view that federal regulation is clearly indicated in such areas as signals carried, technical standards, program origination, cross-ownership of cable and other media, and equal employment opportunities. And federal regulation of matters directly affecting programs and signals carried is, of course, entirely consistent with United States v. Southwestern Cable Co., 392 U.S. 157 (1968).

The comments generally advanced persuasive arguments against federal licensing. We agree with the contention that federal licensing at this time would place an unmanageable administrative burden on the Commission. Accordingly, we will not now take that step. Furthermore, local governments are markedly involved, since cable must make use of streets and alleys, and local authorities are able to bring to bear a special expertness on such matters, for example, as how best to parcel

a large urban area into cable districts. Local authorities are also in a more effective position to follow up on service complaints.

Accordingly, we will leave a number of areas to local regulation, but will take steps to insure efficient nationwide communications service with adequate facilities at reasonable charges. And we will expect to accomplish this by specifying minimum requirements in the local franchising process.

APPENDIX II

THE 1971 WARC CONFERENCE

Appendix

THE 1971 WARC CONFERENCE

At the Conference which was held in Geneva during June and July of 1971 over 700 delegates from 101 countries concerned themselves with the development of a new framework for the

use of satellites in space telecommunications. Seven major committees were formed including those in the areas of technical matters, allocation, regulation, and editorial matters. Working Groups and smaller sub-groups were established to facilitate the work of the conference. The input to the conference came from proposals submitted by member administrations and reports by the permanent bodies of the ITU. Of particular importance here was the CCIR report based on its Joint Special Meeting of January and February, 1971. There were over 400 documents in the main series at the conference in addition to numerous working documents and other papers. The output of the conference originated with the sub-groups and then proceeded to the working groups and the committees. Following this the materials were considered by the editorial committee and finally discussed by the conference in plenary session.

The final acts of the WARC were signed by the participating delegations and are now subject to approval by the members of the ITU. The final acts themselves vary greatly and relate to both technical regulations which will result in partial revision of the Radio Regulations as of 1 January 1973 which will be binding on members, and also resolutions and recommendations which do not have a binding nature.

Frequency Allocations

Concerning frequency allocations, the WARC provided for a number of allocations to various space radio-communication services. However, particular limitations and constraints concerning technical characteristics, notification, registration and coordination procedures circumscribed the allocation process. Further, footnotes were employed as a procedural device to modify certain frequency allocations. Since in any international conference there is bound to be some necessity for compromise, the results of the WARC cannot be judged solely from a technical point of view but must also be evaluated in terms of the conflicting interests that were present and the resultant negotiations.

The allocations of the WARC for television and radio to the fixed satellite service included both the point-to-point communication satellite service and the distribution satellite service. Further new allocations were made to the broadcasting satellite service. Subject to many of the constraints commented upon above the following frequency bands were allocated to the broadcasting satellite service:

MHz 470-890 Region 2 on a shared basis with
MHz 582-606 Region 1 other space services (fixed,

MHz 606-790 Region 1 mobile, radio-navigation).

MHz 710-942 Region 3

In the range 2500-2690 MHz, the allocation was made for Regions 1 through 3 on a shared basis with the additional provision that the use of this band by the broadcasting satellite service is limited to domestic and regional systems for community reception, and that such use is subject to agreement among the administrations concerned. The same provisions were also adopted for the fixed satellite service in this band.

Additional allocations of interest are as follows:

GHz 11.7-12.5 Regions 1-3 on a shared basis (fixed, mobile, terrestrial broadcasting)

The above allocation was made with the provision that existing and future fixed, mobile and broadcasting services would not cause harmful interference to broadcasting satellite stations operating in accordance with the decisions of the appropriate broadcasting frequency assignment planning conference.

GHz	22.5-23	Region 3	on a shared basis
GHz	41-43	Regions 1-3	on an exclusive basis
GHz	84-86	Regions 1-3	on an exclusive basis

A detailed list of the allocations can be found by consulting the final acts of the WARC conference. One of the significant implications growing out of these frequency allocations is the increased interest shown by the representatives of the developing nations. As the technology develops, more and more national administrations are beginning to realize the potential of the broadcast satellite for educational and informational purposes, and therefore it becomes important to see that as many nations as wish to can participate in satellite communication in an optimum fashion.

In addition to frequency allocation, technical regulatory provisions were considered at the WARC which concerned procedures for the determination of the coordination area around an earth station, and similar matters which can be found in the final acts of the WARC. These provisions are extremely complicated and require an extensive technical background on the part of the reader.

General Resolutions

On a more general level, the WARC was concerned with equality among nations in the use of frequency bands for space radiocommunication services. A resolution was passed which should be of special interest to developing nations which are considering developing their own or regional systems, but have not yet begun. The problems of pre-emption of the frequency spectrum and the geostationary orbit had been raised a number of times at the WARC, and the following resolution was an attempt to allay the fears that had been expressed. The conference:

"Considering that all countries have equal rights in the use of both the radio frequencies allocated to various space radiocommunication services and the geostationary satellite orbit for these services;

Taking into account that the radio frequency spectrum and the geostationary orbit are limited natural resources and should be most effectively and economically used;

Resolves that the registration with the ITU of frequency assignments for space radiocommunication services and their use should not provide any permanent priorities for any individual country or groups of countries and should not create an obstacle to the establishment of space systems by other countries...." 1

It is not as yet clear what impact this resolution will have on the launching and deployment of satellites for

communication purposes, but it does indicate an awareness of the situation and an opinion that the allocation of frequencies and the utilization of orbital slots may not be a purely technical matter, but may have significant political and developmental facets.

The WARC also adopted a resolution dealing with the establishment of agreements and associated plans for the broadcasting-satellite service. In the operative paragraphs of this resolution it was stated:

"That stations in the broadcasting satellite service shall be established and operated in accordance with agreements and associated plans adopted by world or regional administrative conferences, as the case may be, in which all the administrations concerned and the administrations whose services are liable to be affected may participate;

That the Administrative Council be requested to examine as soon as possible the question of a world administrative conference, and/or regional administrative conferences as required, with a view to fixing suitable dates, places and agenda;

That during the period before the entry into force of such agreements and associated plans the administrations and the IFRB shall apply the procedure contained in Resolution No. Spa G." (a)

The interim arrangements referred to in the preceding paragraph have been adopted and this means that satellite broadcasting systems can be established before any specific

plans have been established. Since there was some controversy over the desirability of such plans, this is probably the best alternative.

One additional problem which was considered in detail by developing nations at the WARC was that concerning the possibility of the reception of unwanted satellite broadcasts. This is often referred to as the spillover problem. While it was beyond the competence of the ITU to be concerned with questions of problems content control and the political aspects of propaganda broadcasting, the WARC did produce a new regulation for inclusion in Article 7 of the Radio Regulations which states:

"In devising the characteristics of a broadcasting space station, all technical means available shall be used to reduce, to the maximum extent practicable, the radiation over the territory of other countries unless an agreement has been previously reached with such countries. RA ③

It is apparent that such a regulation will be effective only to the extent that there is no open hostility between the nations involved. Technological developments in the area of beam-shaping may also help to negate this problem.

There were also a number of definitions developed at the WARC which can be found in the final documents of the conference. There was general disagreement as to the

adequacy of these definitions, and there were found to be inconsistencies with definitions that have been used by UNESCO and other international organizations. This area will require further study and negotiation at future conferences.

It is still much too early to assess the full value of the WARC, but it is apparent that there is international concern over the utilization by all nations of the space broadcasting potential and that this concern will be growing in the future. At the 1973 Plenipotentiary Conference of the ITU, many of the issues mentioned above will be discussed again in different forms and it would be desirable for all nations to devote some considerable time to preparing for this meeting.

FOOTNOTES

1. Resolution Spa D. "Relating to the Use by All Countries with Equal Rights of Frequency Bands for Space Radio-communication Services," WARC, June-July, 1971, Geneva.
2. Resolution Spa F. "Relating to the Establishment of Agreements and Associated Plans for the Broadcasting-Satellite Service," WARC, June-July, Geneva.
3. Reg. 428A for inclusion in Article 7 of the ITU Radio Regulations. For a consideration of this problem, see also the reports of the U.N. Working Group on Direct Broadcasting Satellites.

APPENDIX III

THE DEVELOPMENT OF THE TELECOMMUNICATIONS INDUSTRY



Appendix

THE DEVELOPMENT OF THE
TELECOMMUNICATIONS INDUSTRY

The chief non-government users of the radio spectrum are the communications carriers who qualify as public utilities and are regulated by the federal agencies. The monopoly franchises were gained by the carriers in the 1930's with the emergence of the philosophy of the natural monopoly.¹ Competition was considered wasteful, costly and inefficient - thus the promotion of the public interest was equated with the successful operation of the common carrier system. Common carriers were entrusted with the maintenance of systemic integrity and the duty of planning regional and national requirements. In return for a franchise grant, the carriers were obliged to submit its expenses, revenues, profits, and services to public scrutiny and review.

That particular regulatory scheme was explained in terms of promoting the general welfare. Carrier planning on a larger scale was expected to guarantee the efficient use of plant and facilities because of the carrier's ability to determine overall requirements, alternate routings, and reserve capacity for a given area. It was also assumed that carriers would innovate at a rate sufficient to maintain the quality of service and satisfy the needs of subscribers.

The role of the regulatory agency in this scheme is and was to prevent the carriers from employing its monopoly base to assign extortionist prices from the subscribing public. At the same time, the regulatory agency must allow the carriers sufficient revenues to compete in the capital market. However, the task of discovering the interest of the carriers and the public interest (consumers at large) is very difficult. The regulation process, in the United States, has attempted to combine the incentives of private ownership with the constraints of public regulation in the Communications and some other industries. The verdict on the success of this policy will be more easily reached upon the examination of the carrier and related industries.

In the United States, the domestic telecommunication carriers provide two broad types of service. The first is a message telephone service consisting of the dial-up service rendered on a local exchange basis or on a long-distance or toll basis. The second service consists of leased circuits to communication service subscribers on a private or exclusive use basis. These circuits can be utilized for voice, data, facsimile, or video signals.

The major portion of the nation's public telephone service is supplied by the American Telephone and Telegraph Company (AT&T) and its member operating companies. AT&T acts as both a holding and an operating company. AT&T and

its affiliates provide 84 per cent of the local exchange telephone market, with particular concentration in the urban areas.² Of the remaining share of the market, 6 per cent is supplied by the General Telephone and Electronics System, and the rest by various independent utilities.³

Public service is also supplied by the Western Union Telegraph Company in the areas of message telegraph transmission, telegram service, and the TELEX service, a switched teletypewriter service. Although the public message service has declined in recent years, Western Union has experienced growth in the TELEX service, automated information services (INFOCOM and SICOM) and in government leased services.

In order to gain a total picture of the communications industry, a short examination of the telecommunications equipment market is also necessary. This is particularly important because the equipment market is derived from the demand for communications services, while equipment prices are one of the factors which the FCC considers in its rate-setting process.

Similar to the communications services sector, the equipment market, which is not publicly regulated, is dominated by one manufacturer and supplier, this being Western Electric, AT&T's subsidiary and supply agent. Western's sales account for about 84 per cent of the equipment market, with 90 per cent of these supply purchases going to AT&T and its affiliates.⁴ The bulk of the remaining Western sales are purchased by the United States government. The remaining share of the market, about 16 per cent, is dominated by the supply affiliates of the General Telephone System (Automatic Electric, Lenkurt, and Sylvania). General's affiliates account for some 50 per cent of that market.⁵

The statistics provided above clearly present the salient characteristic of the telecommunications industry - the common carrier - supplier relationship

defined also as vertical integration. The AT&T and Western Electric relationship extend into the research and development field, for each own 50 per cent of Bell Laboratories, and make up what is commonly known as "The Bell System." Likewise General Telephone and Electronics System is also vertically linked with its supply affiliates.

The integrated structure is a key industry factor for a number of reasons. First, the quality and type of service offered by the carrier is dependent on the nature of hardware provided by the integrated supplier. This also implies that equipment costs translate into prices charged to subscribers and users of communication service. Some 65 per cent of AT&T's plant investment is dependent upon purchase from Western Electric.⁶

Second, the purchasing patterns of the integrated carrier acts to restrict market opportunities to outside suppliers. At the same time, the structure also controls the rate of technological advance through integration and procurement policies.⁷ Because the integrated supplier takes the bulk of its needs from captive supply affiliates, the utility-supplier relationship also constricts market opportunities and dictates technological developments at that level.

Finally, the common ownership of carrier and supplier poses additional problems for the regulatory agencies. The supplier holds a captive market in the hardware field, while at the same time, as a private concern, it argues that its risks are similar to other manufacturers and thus immunity from public regulation is created. However, at opportune times the supplier also pleads that indirect regulation via public control over utilities should place it beyond the reach of antitrust legislation.⁸

It is clear that the integrated supplier would prefer to sit on the fence separating antitrust and regulation. This would not be unworkable

if the public interest would be protected through various safeguard measures. But with the increasing demand and technological change in the communications industry, a sheltered static entity cannot be tolerated. The public interest would best be served by injecting dynamism via entry of new suppliers of both telecommunications equipment and service. The best means to do so, especially in view of teleconferencing needs, will become apparent after the examination of the evolution and state of the present system.

The early history of the communications industry formed a pattern which strongly influenced its latter evolution. Subsequent direct as well as indirect policies by government bodies (federal agencies and the legislature) also contributed to the present situation characterized by vertical integration and domination by a single carrier and supplier.

The pattern of development was by the creation of the Bell Company based on Bell's telephone patent in 1876. The company was challenged by Western Union on the basis of improved telephone service, but the firms realized that protracted conflict would prove too costly. In 1879 an agreement between the firms created monopoly, with Bell acquiring total control over voice communications.

The following years, Bell, in addition to its original patent, purchased patent rights of new developments and proceeded to take advantage of its long-distance capability. Bell licensed operating companies in a manner that gave it financial control through stock ownership and income through rental fees. The long-line capability was used to establish a department which would weld individual companies into a nationwide system. In 1882 Bell acquired control of Western Electric to serve as an equipment supplier.

These early developments in Bell's corporate history gave it an impetus and ability to overcome any competition after the basic patent rights expired. Bell was able, in the period of 1895 to 1913, to a) destroy their competitors' efforts in the long-distance telephone system, b) exercise political pressure to curb the growth of the independents, c) refuse successfully, to interconnect with non-Bell companies, and d) pursue an aggressive program of independent telephone property purchase.

Thus, by 1913 Bell had eliminated all competitors and was on the verge of realizing its goal of "one system, universal and intra-dependent."⁹ The only obstacle in its way were the early state regulatory commissions. Bell approached this challenge with a view of achieving rapport with the regulators. Key policies were enlightened - management behavior, corporate statesmanship, quality of service, and financial conservation. Thus the regulatory concern over matters affecting market structure and price was minimal.

The regulatory agency allowed Bell to make various horizontal acquisitions in the 1930's without a challenge. The vertical acquisition of Western Electric in 1881 allowed Bell to control and also to control the equipment side of the telecommunication market, and went unchallenged for years. In fact during this formative period, the enforcement of antitrust legislation was low-key. All this changed in 1949 when the Department of Justice charged that Western Electric's control of the hardware market infringed the Sherman Antitrust Act. It sought to divest Western Electric from the Bell System and require AT&T and its operating companies to purchase equipment in the competitive market. Basically the Justice Department wanted to restructure the hardware market with the aim of restoring free competition and market rivalry.

The suit was abandoned in 1956, and the Department watered down its demands. A consent decree was entered by the Department which was radically different from the original divestiture action. The decree required Western to forfeit certain noncommunications subsidiaries and required Bell to open its patent portfolio to all firms on a royalty-free basis.¹⁰ However, nothing else changed and Western Electric still remains Bell System's exclusive supplier.

There was some controversy as to the reasons for the weakness of the 1956 consent decree. The Justice Department felt it could not win the case, that the FCC could adequately regulate Western, and that divestiture would lead to higher rates. Critics meanwhile contend that the above explanation is not well founded and that Western's role as an important defense contract supplier was the main factor against divestiture.

The role of merger policy in the independent communications industry is similarly neglected. Some 80 per cent of 1,800 firms are of the holding company operation and control type. The regulatory agencies have allowed horizontal and vertical mergers with few exceptions. Thus the independent market is also typified by a vertical relationship structure, utility-supplier links, which tend to restrict market opportunities for nonaffiliated suppliers.

Further buttressing of the vertical integration structure is done through various indirect policies. These include tariff practices filed by the carriers, government practices and import duties on telecommunication equipment.

Tariff practices fall under two categories - interconnection and foreign attachment tariffs. The first refers to a rule forbidding customer communication systems from being attached to the telephone dial-up network. The FCC has upheld the rule in many cases such as Western Union's effort to interconnect its relay system or the video broadcasting microwave relay

system which has to be phased out in areas where AT&T introduces its own facilities. The latter practice, the foreign attachment tariff, is used to prohibit customer owned equipment from being attached to the carrier's switched lines. Both of these practices have kept out independent suppliers and also limited the consumer's choice to leasing equipment from the carrier alone.

The other indirect policies are also twofold. The government buying practices reinforce the existing system because it generally leases carrier services. Meanwhile the tariff policy has sheltered the domestic market from foreign competition by assigning about a 16 per cent ad valorem¹¹ duty on imports. In sum, these policies have also helped to maintain the utility-supplier relationship.

Much has been written so far about the evils of vertical integration in the communications industry, but this basic premise must also be justified. In a highly competitive market where cost efficiency is important and there are no artificial restraints to entry some economist recommend vertical integration. However, in a market where one firm has substantial monopoly power this may not be true.

A public utility has monopoly power and is regulated by government agencies. Market forces do not affect the utilities and entry is forbidden. Thus monopoly power, although suspended has a great potential.

The regulation must be effective because carriers generally dislike close scrutiny, but at the same time like direct and indirect policies which keep out competitors. This presents the dangers of rate manipulation, inflated prices and rate of return valuations. Costs may be incurred for lobbying, public relations and market protection. It can also lead to price-fixing in relation to its suppliers and at the public expense. Finally, innovative efforts may be stifled.

The above dangers are even more crucial where the utility-supplier relationship exists. There is an opportunity to channel the monopoly power to submarkets. Thus large suppliers also behave like regulated firms. The supplier can siphon its monopoly power to other markets and its relationship to non-integrated suppliers. The avoidance of such practices calls for vigorous actions by federal agencies which will be suggested in a subsequent section.

FOOTNOTES

1. Harry M. Trebing, "Common Carrier Regulation - The Silent Crisis," 34 Law and Contemporary Problems 299, at 306 (1969).
2. Manley Irwin, The Telecommunications Industry, (1971), 25.
3. Ibid., at 26.
4. Ibid., at 27.
5. Ibid., at 28.
6. Ibid., at 30.
7. Trebing, supra note 1 at 306. The Bell system is particularly successful due to the dual ownership of Bell Laboratories by AT&T and Western Electric.
8. Consent Decree, United States v. Western Electric Co., Civ. No. 17-49 (D.N.J. January 24, 1964).
9. Trebing, supra note 1 at 305.
10. Consent Decree, supra note 8.
11. Irwin, supra note 2 at 75.

APPENDIX IV

THE PUBLIC BROADCASTING ACT OF 1967

SEC. 3. The medals authorized to be issued pursuant to this Act shall be of such size or sizes and of such metals as shall be determined by the Secretary of the Treasury in consultation with such Board.

Size, etc.

Approved November 4, 1967.

Public Law 90-129

AN ACT

November 7, 1967
[S. 1160]

To amend the Communications Act of 1934 by extending and improving the provisions thereof relating to grants for construction of educational television broadcasting facilities, by authorizing assistance in the construction of noncommercial educational radio broadcasting facilities, by establishing a nonprofit corporation to assist in establishing innovative educational programs, to facilitate educational program availability, and to aid the operation of educational broadcasting facilities; and to authorize a comprehensive study of instructional television and radio; and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Public Broadcasting Act of 1967".

Public Broad-
casting Act of
1967.

TITLE I—CONSTRUCTION OF FACILITIES

EXTENSION OF DURATION OF CONSTRUCTION GRANTS FOR EDUCATIONAL BROADCASTING

SEC. 101. (a) Section 391 of the Communications Act of 1934 (47 U.S.C. 391) is amended by inserting after the first sentence the following new sentence: "There are also authorized to be appropriated for carrying out the purposes of such section, \$10,500,000 for the fiscal year ending June 30, 1968, \$12,500,000 for the fiscal year ending June 30, 1969, and \$15,000,000 for the fiscal year ending June 30, 1970."

76 Stat. 65.

(b) The last sentence of such section is amended by striking out "July 1, 1968" and inserting in lieu thereof "July 1, 1971".

MAXIMUM ON GRANTS IN ANY STATE

SEC. 102. Effective with respect to grants made from appropriations for any fiscal year beginning after June 30, 1967, subsection (b) of section 392 of the Communications Act of 1934 (47 U.S.C. 392(b)) is amended to read as follows:

"(b) The total of the grants made under this part from the appropriation for any fiscal year for the construction of noncommercial educational television broadcasting facilities and noncommercial educational radio broadcasting facilities in any State may not exceed 8½ per centum of such appropriation."

NONCOMMERCIAL EDUCATIONAL RADIO BROADCASTING FACILITIES

SEC. 103. (a) Section 390 of the Communications Act of 1934 (47 U.S.C. 390) is amended by inserting "noncommercial" before "educational" and by inserting "or radio" after "television".

(b) Subsection (a) of section 392 of the Communications Act of 1934 (47 U.S.C. 392(a)) is amended by—

(1) inserting "noncommercial" before "educational" and by inserting "or radio" after "television" in so much thereof as precedes paragraph (1);

(2) striking out clause (B) of such paragraph and inserting in lieu thereof "(B) in the case of a project for television facilities,

the State noncommercial educational television agency or, in the case of a project for radio facilities, the State educational radio agency,";

(3) inserting "(i) in the case of a project for television facilities," after "(D)" and "noncommercial" before "educational" in paragraph (1) (D) and by inserting before the semicolon at the end of such paragraph "or (ii) in the case of a project for radio facilities, a nonprofit foundation, corporation, or association which is organized primarily to engage in or encourage noncommercial educational radio broadcasting and is eligible to receive a license from the Federal Communications Commission; or meets the requirements of clause (i) and is also organized to engage in or encourage such radio broadcasting and is eligible for such a license for such a radio station";

(4) striking out "or" immediately preceding "(D)" in paragraph (1), and by striking out the semicolon at the end of such paragraph and inserting in lieu thereof the following: "or (E) a municipality which owns and operates a broadcasting facility transmitting only noncommercial programs:";

(5) striking out "television" in paragraphs (2), (3), and (4) of such subsection:

(6) striking out "and" at the end of paragraph (3), striking out the period at the end of paragraph (4) and inserting in lieu thereof "; and", and inserting after paragraph (4) the following new paragraph:

"(5) that, in the case of an application with respect to radio broadcasting facilities, there has been comprehensive planning for educational broadcasting facilities and services in the area the applicant proposes to serve and the applicant has participated in such planning, and the applicant will make the most efficient use of the frequency assignment."

(c) Subsection (c) of such section is amended by inserting "(1)" after "(c)" and "noncommercial" before "educational television broadcasting facilities", and by inserting at the end thereof the following new paragraph:

"(2) In order to assure proper coordination of construction of noncommercial educational radio broadcasting facilities within each State which has established a State educational radio agency, each applicant for a grant under this section for a project for construction of such facilities in such State, other than such agency, shall notify such agency of each application for such a grant which is submitted by it to the Secretary, and the Secretary shall advise such agency with respect to the disposition of each such application."

(d) Subsection (d) of such section is amended by inserting "noncommercial" before "educational television" and inserting "or noncommercial educational radio broadcasting facilities, as the case may be," after "educational television broadcasting facilities" in clauses (2) and (3).

(e) Subsection (f) of such section is amended by inserting "or radio" after "television" in the part thereof which precedes paragraph (1), by inserting "noncommercial" before "educational television purposes" in paragraph (2) thereof, and by inserting "or noncommercial educational radio purposes, as the case may be" after "educational television purposes" in such paragraph (2).

(f) (1) Paragraph (2) of section 394 of such Act (47 U.S.C. 394) is amended by inserting "or educational radio broadcasting facilities" after "educational television broadcasting facilities," and by inserting "or radio broadcasting, as the case may be" after "necessary for television broadcasting".

(2) Paragraph (4) of such section is amended by striking out "The term 'State educational television agency' means" and inserting in lieu thereof "The terms 'State educational television agency' and 'State educational radio agency' mean, with respect to television broadcasting and radio broadcasting, respectively," and by striking out "educational television" in clauses (A) and (C) and inserting in lieu thereof "such broadcasting".

(g) Section 397 of such Act (47 U.S.C. 397) is amended by inserting "or radio" after "television" in clause (2).

FEDERAL SHARE OF COST OF CONSTRUCTION

SEC. 104. Subsection (e) of section 392 of the Communications Act of 1934 (47 U.S.C. 392(e)) is amended to read as follows:

"(e) Upon approving any application under this section with respect to any project, the Secretary shall make a grant to the applicant in the amount determined by him, but not exceeding 75 per centum of the amount determined by the Secretary to be the reasonable and necessary cost of such project. The Secretary shall pay such amount from the sum available therefor, in advance or by way of reimbursement, and in such installments consistent with construction progress, as he may determine."

INCLUSION OF TERRITORIES

SEC. 105. (a) Paragraph (1) of section 394 of the Communications Act of 1934 is amended by striking out "and" and inserting a comma in lieu thereof, and by inserting before the period at the end thereof "the Virgin Islands, Guam, American Samoa, and the Trust Territory of the Pacific Islands".

(b) Paragraph (4) of such section is amended by inserting "and, in the case of the Trust Territory of the Pacific Islands, means the High Commissioner thereof" before the period at the end thereof.

INCLUSION OF COSTS OF PLANNING

SEC. 106. Paragraph (2) of section 394 of the Communications Act of 1934 is further amended by inserting at the end thereof the following: "In the case of apparatus the acquisition and installation of which is so included, such term also includes planning therefor."

TITLE II—ESTABLISHMENT OF NONPROFIT EDUCATIONAL BROADCASTING CORPORATION

SEC. 201. Part IV of title III of the Communications Act of 1934 is further amended by—

(1) inserting

"SUBPART A—GRANTS FOR FACILITIES"

immediately above the heading of section 390;

(2) striking out "part" and inserting in lieu thereof "subpart" in sections 390, 393, 395, and 396;

(3) redesignating section 397 as section 398, and redesignating section 394 as section 397 and inserting it before such section 398, and inserting immediately above its heading the following:

"SUBPART C—GENERAL"

(4) redesignating section 396 as section 394 and inserting it immediately after section 393;

Ante, p. 367.

(5) inserting after "broadcasting" the first time it appears in clause (2) of the section of such part IV redesignated herein as section 398 " , or over the Corporation or any of its grantees or contractors, or over the charter or bylaws of the Corporation,"

(6) inserting in the section of such part IV herein redesignated as section 397 the following new paragraphs:

"Corporation."

"(6) The term 'Corporation' means the Corporation authorized to be established by subpart B of this part.

"Noncommercial educational broadcast station."

"(7) The term 'noncommercial educational broadcast station' means a television or radio broadcast station, which (A) under the rules and regulations of the Federal Communications Commission in effect on the date of enactment of the Public Broadcasting Act of 1967, is eligible to be licensed or is licensed by the Commission as a noncommercial educational radio or television broadcast station and which is owned and operated by a public agency or nonprofit private foundation, corporation, or association or (B) is owned and operated by a municipality and which transmits only noncommercial programs for educational purposes.

"Interconnection."

"(8) The term 'interconnection' means the use of microwave equipment, boosters, translators, repeaters, communication space satellites, or other apparatus or equipment for the transmission and distribution of television or radio programs to noncommercial educational television or radio broadcast stations.

"Educational television or radio programs."

"(9) The term 'educational television or radio programs' means programs which are primarily designed for educational or cultural purposes."

(7) striking out the heading of such part IV and inserting in lieu thereof the following:

"PART IV—GRANTS FOR NONCOMMERCIAL EDUCATIONAL BROADCASTING FACILITIES; CORPORATION FOR PUBLIC BROADCASTING"

(8) inserting immediately after the section herein redesignated as section 398 the following:

"EDITORIALIZING AND SUPPORT OF POLITICAL CANDIDATES PROHIBITED"

"Sec. 399. No noncommercial educational broadcasting station may engage in editorializing or may support or oppose any candidate for political office."

(9) inserting after section 395 the following new subpart:

"SUBPART B—CORPORATION FOR PUBLIC BROADCASTING"

"Congressional Declaration of Policy"

"Sec. 396. (a) The Congress hereby finds and declares—

"(1) that it is in the public interest to encourage the growth and development of noncommercial educational radio and television broadcasting, including the use of such media for instructional purposes;

"(2) that expansion and development of noncommercial educational radio and television broadcasting and of diversity of its programming depend on freedom, imagination, and initiative on both the local and national levels;

"(3) that the encouragement and support of noncommercial educational radio and television broadcasting, while matters of importance for private and local development, are also of appropriate and important concern to the Federal Government;

"(4) that it furthers the general welfare to encourage noncommercial educational radio and television broadcast programming

which will be responsive to the interests of people both in particular localities and throughout the United States, and which will constitute an expression of diversity and excellence;

“(5) that it is necessary and appropriate for the Federal Government to complement, assist, and support a national policy that will most effectively make noncommercial educational radio and television service available to all the citizens of the United States;

“(6) that a private corporation should be created to facilitate the development of educational radio and television broadcasting and to afford maximum protection to such broadcasting from extraneous interference and control.

“Corporation Established

“(b) There is authorized to be established a nonprofit corporation to be known as the ‘Corporation for Public Broadcasting’, which will not be an agency or establishment of the United States Government. The Corporation shall be subject to the provisions of this section, and, to the extent consistent with this section, to the District of Columbia Nonprofit Corporation Act.

76 Stat. 265.
D.C. Code
29-1001.

“Board of Directors

“(c) (1) The Corporation shall have a Board of Directors (hereinafter in this section referred to as the ‘Board’), consisting of fifteen members appointed by the President, by and with the advice and consent of the Senate. Not more than eight members of the Board may be members of the same political party.

“(2) The members of the Board (A) shall be selected from among citizens of the United States (not regular fulltime employees of the United States) who are eminent in such fields as education, cultural and civic affairs, or the arts, including radio and television: (B) shall be selected so as to provide as nearly as practicable a broad representation of various regions of the country, various professions and occupations, and various kinds of talent and experience appropriate to the functions and responsibilities of the Corporation.

“(3) The members of the initial Board of Directors shall serve as incorporators and shall take whatever actions are necessary to establish the Corporation under the District of Columbia Nonprofit Corporation Act.

“(4) The term of office of each member of the Board shall be six years; except that (A) any member appointed to fill a vacancy occurring prior to the expiration of the term for which his predecessor was appointed shall be appointed for the remainder of such term; and (B) the terms of office of members first taking office shall begin on the date of incorporation and shall expire, as designated at the time of their appointment, five at the end of two years, five at the end of four years, and five at the end of six years. No member shall be eligible to serve in excess of two consecutive terms of six years each. Notwithstanding the preceding provisions of this paragraph, a member whose term has expired may serve until his successor has qualified.

“(5) Any vacancy in the Board shall not affect its power, but shall be filled in the manner in which the original appointments were made.

“Election of Chairman; Compensation

“(d) (1) The President shall designate one of the members first appointed to the Board as Chairman; thereafter the members of the Board shall annually elect one of their number as Chairman. The members of the Board shall also elect one or more of them as a Vice Chairman or Vice Chairmen.

Term of office.

"(2) The members of the Board shall not, by reason of such membership, be deemed to be employees of the United States. They shall, while attending meetings of the Board or while engaged in duties related to such meetings or in other activities of the Board pursuant to this subpart be entitled to receive compensation at the rate of \$100 per day including travel time, and while away from their homes or regular places of business they may be allowed travel expenses, including per diem in lieu of subsistence, equal to that authorized by law (5 U.S.C. 5703) for persons in the Government service employed intermittently.

80 Stat. 499.

"Officers and Employees

"(e) (1) The Corporation shall have a President, and such other officers as may be named and appointed by the Board for terms and at rates of compensation fixed by the Board. No individual other than a citizen of the United States may be an officer of the Corporation. No officer of the Corporation, other than the Chairman and any Vice Chairman, may receive any salary or other compensation from any source other than the Corporation during the period of his employment by the Corporation. All officers shall serve at the pleasure of the Board.

"(2) Except as provided in the second sentence of subsection (e) (1) of this section, no political test or qualification shall be used in selecting, appointing, promoting, or taking other personnel actions with respect to officers, agents, and employees of the Corporation.

"Nonprofit and Nonpolitical Nature of the Corporation

"(f) (1) The Corporation shall have no power to issue any shares of stock, or to declare or pay any dividends.

"(2) No part of the income or assets of the Corporation shall inure to the benefit of any director, officer, employee, or any other individual except as salary or reasonable compensation for services.

"(3) The Corporation may not contribute to or otherwise support any political party or candidate for elective public office.

"Purposes and Activities of the Corporation

"(g) (1) In order to achieve the objectives and to carry out the purposes of this subpart, as set out in subsection (a), the Corporation is authorized to—

"(A) facilitate the full development of educational broadcasting in which programs of high quality, obtained from diverse sources, will be made available to noncommercial educational television or radio broadcast stations, with strict adherence to objectivity and balance in all programs or series of programs of a controversial nature;

"(B) assist in the establishment and development of one or more systems of interconnection to be used for the distribution of educational television or radio programs so that all noncommercial educational television or radio broadcast stations that wish to may broadcast the programs at times chosen by the stations;

"(C) assist in the establishment and development of one or more systems of noncommercial educational television or radio broadcast stations throughout the United States;

"(D) carry out its purposes and functions and engage in its activities in ways that will most effectively assure the maximum freedom of the noncommercial educational television or radio broadcast systems and local stations from interference with or control of program content or other activities.

“(2) Included in the activities of the Corporation authorized for accomplishment of the purposes set forth in subsection (a) of this section, are, among others not specifically named—

“(A) to obtain grants from and to make contracts with individuals and with private, State, and Federal agencies, organizations, and institutions;

“(B) to contract with or make grants to program production entities, individuals, and selected noncommercial educational broadcast stations for the production of, and otherwise to procure, educational television or radio programs for national or regional distribution to noncommercial educational broadcast stations;

“(C) to make payments to existing and new noncommercial educational broadcast stations to aid in financing local educational television or radio programming costs of such stations, particularly innovative approaches thereto, and other costs of operation of such stations;

“(D) to establish and maintain a library and archives of noncommercial educational television or radio programs and related materials and develop public awareness of and disseminate information about noncommercial educational television or radio broadcasting by various means, including the publication of a journal;

“(E) to arrange, by grant or contract with appropriate public or private agencies, organizations, or institutions, for interconnection facilities suitable for distribution and transmission of educational television or radio programs to noncommercial educational broadcast stations;

“(F) to hire or accept the voluntary services of consultants, experts, advisory boards, and panels to aid the Corporation in carrying out the purposes of this section;

“(G) to encourage the creation of new noncommercial educational broadcast stations in order to enhance such service on a local, State, regional, and national basis;

“(H) conduct (directly or through grants or contracts) research, demonstrations, or training in matters related to noncommercial educational television or radio broadcasting.

“(3) To carry out the foregoing purposes and engage in the foregoing activities, the Corporation shall have the usual powers conferred upon a nonprofit corporation by the District of Columbia Nonprofit Corporation Act, except that the Corporation may not own or operate any television or radio broadcast station, system, or network, community antenna television system, or interconnection or program production facility.

76 Stat. 265.
D. C. Code
29-1001.

“Authorization for Free or Reduced Rate Interconnection Service

“(h) Nothing in the Communications Act of 1934, as amended, or in any other provision of law shall be construed to prevent United States communications common carriers from rendering free or reduced rate communications interconnection services for noncommercial educational television or radio services, subject to such rules and regulations as the Federal Communications Commission may prescribe.

48 Stat. 1064.
47 USC 609.

“Report to Congress

“(i) The Corporation shall submit an annual report for the preceding fiscal year ending June 30 to the President for transmittal to the Congress on or before the 31st day of December of each year. The report shall include a comprehensive and detailed report of the Cor-

poration's operations, activities, financial condition, and accomplishments under this section and may include such recommendations as the Corporation deems appropriate.

"Right To Repeal, Alter, or Amend

"(j) The right to repeal, alter, or amend this section at any time is expressly reserved.

"Financing

"(k) (1) There are authorized to be appropriated for expenses of the Corporation for the fiscal year ending June 30, 1968, the sum of \$9,000,000, to remain available until expended.

"(2) Notwithstanding the preceding provisions of this section, no grant or contract pursuant to this section may provide for payment from the appropriation for the fiscal year ending June 30, 1968, for any one project or to any one station of more than \$250,000.

"Records and Audit

"(1) (1) (A) The accounts of the Corporation shall be audited annually in accordance with generally accepted auditing standards by independent certified public accountants or independent licensed public accountants certified or licensed by a regulatory authority of a State or other political subdivision of the United States. The audits shall be conducted at the place or places where the accounts of the Corporation are normally kept. All books, accounts, financial records, reports, files, and all other papers, things, or property belonging to or in use by the Corporation and necessary to facilitate the audits shall be made available to the person or persons conducting the audits; and full facilities for verifying transactions with the balances or securities held by depositories, fiscal agents and custodians shall be afforded to such person or persons.

"(B) The report of each such independent audit shall be included in the annual report required by subsection (i) of this section. The audit report shall set forth the scope of the audit and include such statements as are necessary to present fairly the Corporation's assets and liabilities, surplus or deficit, with an analysis of the changes therein during the year, supplemented in reasonable detail by a statement of the Corporation's income and expenses during the year, and a statement of the sources and application of funds, together with the independent auditor's opinion of those statements.

GAO audit.

"(2) (A) The financial transactions of the Corporation for any fiscal year during which Federal funds are available to finance any portion of its operations may be audited by the General Accounting Office in accordance with the principles and procedures applicable to commercial corporate transactions and under such rules and regulations as may be prescribed by the Comptroller General of the United States. Any such audit shall be conducted at the place or places where accounts of the Corporation are normally kept. The representative of the General Accounting Office shall have access to all books, accounts, records, reports, files, and all other papers, things, or property belonging to or in use by the Corporation pertaining to its financial transactions and necessary to facilitate the audit, and they shall be afforded full facilities for verifying transactions with the balances or securities held by depositories, fiscal agents, and custodians. All such books, accounts, records, reports, files, papers and property of the Corporation shall remain in possession and custody of the Corporation.

“(B) A report of each such audit shall be made by the Comptroller General to the Congress. The report to the Congress shall contain such comments and information as the Comptroller General may deem necessary to inform Congress of the financial operations and condition of the Corporation, together with such recommendations with respect thereto as he may deem advisable. The report shall also show specifically any program, expenditure, or other financial transaction or undertaking observed in the course of the audit, which, in the opinion of the Comptroller General, has been carried on or made without authority of law. A copy of each report shall be furnished to the President, to the Secretary, and to the Corporation at the time submitted to the Congress.”

Report to Congress.

Copy to President, etc.

Records, maintenance and access.

“(3) (A) Each recipient of assistance by grant or contract, other than a fixed price contract awarded pursuant to competitive bidding procedures, under this section shall keep such records as may be reasonably necessary to fully disclose the amount and the disposition by such recipient of the proceeds of such assistance, the total cost of the project or undertaking in connection with which such assistance is given or used, and the amount and nature of that portion of the cost of the project or undertaking supplied by other sources, and such other records as will facilitate an effective audit.

“(B) The Corporation or any of its duly authorized representatives, shall have access for the purpose of audit and examination to any books, documents, papers, and records of the recipient that are pertinent to assistance received under this section. The Comptroller General of the United States or any of his duly authorized representatives shall also have access thereto for such purpose during any fiscal year for which Federal funds are available to the Corporation.”

TITLE III—STUDY OF EDUCATIONAL AND INSTRUCTIONAL BROADCASTING

STUDY AUTHORIZED

SEC. 301. The Secretary of Health, Education, and Welfare is authorized to conduct, directly or by contract, and in consultation with other interested Federal agencies, a comprehensive study of instructional television and radio (including broadcast, closed circuit, community antenna television, and instructional television fixed services and two-way communication of data links and computers) and their relationship to each other and to instructional materials such as videotapes, films, discs, computers, and other educational materials or devices, and such other aspects thereof as may be of assistance in determining whether and what Federal aid should be provided for instructional radio and television and the form that aid should take, and which may aid communities, institutions, or agencies in determining whether and to what extent such activities should be used.

DURATION OF STUDY

SEC. 302. The study authorized by this title shall be submitted to the President for transmittal to the Congress on or before June 30, 1969.

APPROPRIATION

SEC. 303. There are authorized to be appropriated for the study authorized by this title such sums, not exceeding \$500,000, as may be necessary.

Approved November 7, 1967.

APPENDIX V

THE COMMUNICATIONS SATELLITE ACT OF 1962



Public Law 87-624
87th Congress, H. R. 11040
August 31, 1962

An Act

76 STAT. 419.

To provide for the establishment, ownership, operation, and regulation of a commercial communications satellite system, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

TITLE I—SHORT TITLE, DECLARATION OF POLICY AND DEFINITIONS

SHORT TITLE

SEC. 101. This Act may be cited as the "Communications Satellite Act of 1962".

Communications
Satellite Act
of 1962.

DECLARATION OF POLICY AND PURPOSE

SEC. 102. (a) The Congress hereby declares that it is the policy of the United States to establish, in conjunction and in cooperation with other countries, as expeditiously as practicable a commercial communications satellite system, as part of an improved global communications network, which will be responsive to public needs and national objectives, which will serve the communication needs of the United States and other countries, and which will contribute to world peace and understanding.

(b) The new and expanded telecommunication services are to be made available as promptly as possible and are to be extended to provide global coverage at the earliest practicable date. In effectuating this program, care and attention will be directed toward providing such services to economically less developed countries and areas as well as those more highly developed, toward efficient and economical use of the electromagnetic frequency spectrum, and toward the reflection of the benefits of this new technology in both quality of services and charges for such services.

(c) In order to facilitate this development and to provide for the widest possible participation by private enterprise, United States participation in the global system shall be in the form of a private corporation, subject to appropriate governmental regulation. It is the intent of Congress that all authorized users shall have nondiscriminatory access to the system; that maximum competition be maintained in the provision of equipment and services utilized by the system; that the corporation created under this Act be so organized and operated as to maintain and strengthen competition in the provision of communications services to the public; and that the activities of the corporation created under this Act and of the persons or companies participating in the ownership of the corporation shall be consistent with the Federal antitrust laws.

(d) It is not the intent of Congress by this Act to preclude the use of the communications satellite system for domestic communication services where consistent with the provisions of this Act nor to preclude the creation of additional communications satellite systems, if required to meet unique governmental needs or if otherwise required in the national interest.

DEFINITIONS

SEC. 103. As used in this Act, and unless the context otherwise requires—

- (1) the term "communications satellite system" refers to a system of communications satellites in space whose purpose is to relay telecommunication information between satellite terminal sta-

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tions, together with such associated equipment and facilities for tracking, guidance, control, and command functions as are not part of the generalized launching, tracking, control, and command facilities for all space purposes;

(2) the term "satellite terminal station" refers to a complex of communication equipment located on the earth's surface, operationally connected with one or more terrestrial communication systems, and capable of transmitting telecommunications to or receiving telecommunications from a communications satellite system.

(3) the term "communications satellite" means an earth satellite which is intentionally used to relay telecommunication information;

(4) the term "associated equipment and facilities" refers to facilities other than satellite terminal stations and communications satellites, to be constructed and operated for the primary purpose of a communications satellite system, whether for administration and management, for research and development, or for direct support of space operations;

(5) the term "research and development" refers to the conception, design, and first creation of experimental or prototype operational devices for the operation of a communications satellite system, including the assembly of separate components into a working whole, as distinguished from the term "production," which relates to the construction of such devices to fixed specifications compatible with repetitive duplication for operational applications; and

(6) the term "telecommunication" means any transmission, emission or reception of signs, signals, writings, images, and sounds or intelligence of any nature by wire, radio, optical, or other electromagnetic systems.

(7) the term "communications common carrier" has the same meaning as the term "common carrier" has when used in the Communications Act of 1934, as amended, and in addition includes, but only for purposes of sections 303 and 304, any individual, partnership, association, joint-stock company, trust, corporation, or other entity which owns or controls, directly or indirectly, or is under direct or indirect common control with, any such carrier; and the term "authorized carrier", except as otherwise provided for purposes of section 304 by section 304(b)(1), means a communications common carrier which has been authorized by the Federal Communications Commission under the Communications Act of 1934, as amended, to provide services by means of communications satellites;

(8) the term "corporation" means the corporation authorized by title III of this Act.

(9) the term "Administration" means the National Aeronautics and Space Administration; and

(10) the term "Commission" means the Federal Communications Commission.

48 Stat. 1064.
47 USC 609.



TITLE II—FEDERAL COORDINATION, PLANNING, AND
REGULATION

IMPLEMENTATION OF POLICY

SEC. 201. In order to achieve the objectives and to carry out the purposes of this Act—

(a) the President shall—

(1) aid in the planning and development and foster the execution of a national program for the establishment and operation, as expeditiously as possible, of a commercial communications satellite system;

(2) provide for continuous review of all phases of the development and operation of such a system, including the activities of a communications satellite corporation authorized under title VII of this Act;

(3) coordinate the activities of governmental agencies with responsibilities in the field of telecommunication, so as to insure that there is full and effective compliance at all times with the policies set forth in this Act;

(4) exercise such supervision over relationships of the corporation with foreign governments or entities or with international bodies as may be appropriate to assure that such relationships shall be consistent with the national interest and foreign policy of the United States;

(5) insure that timely arrangements are made under which there can be foreign participation in the establishment and use of a communications satellite system;

(6) take all necessary steps to insure the availability and appropriate utilization of the communications satellite system for general governmental purposes except where a separate communications satellite system is required to meet unique governmental needs, or is otherwise required in the national interest; and

(7) so exercise his authority as to help attain coordinated and efficient use of the electromagnetic spectrum and the technical compatibility of the system with existing communications facilities both in the United States and abroad.

(b) the National Aeronautics and Space Administration shall—

(1) advise the Commission on technical characteristics of the communications satellite system;

(2) cooperate with the corporation in research and development to the extent deemed appropriate by the Administration in the public interest;

(3) assist the corporation in the conduct of its research and development program by furnishing to the corporation, when requested, on a reimbursable basis, such satellite launching and associated services as the Administration deems necessary for the most expeditious and economical development of the communications satellite system;

(4) consult with the corporation with respect to the technical characteristics of the communications satellite system;

(5) furnish to the corporation, on request and on a reimbursable basis, satellite launching and associated services required for the establishment, operation, and maintenance of the communications satellite system approved by the Commission; and

(6) to the extent feasible, furnish other services, on a reimbursable basis, to the corporation in connection with the establishment and operation of the system.

(c) the Federal Communications Commission, in its administration of the provisions of the Communications Act of 1934, as amended, and as supplemented by this Act, shall—

48 Stat. 1064.
47 USC 609.

(1) insure effective competition, including the use of competitive bidding where appropriate, in the procurement by the corporation and communications common carriers of apparatus, equipment, and services required for the establishment and operation of the communications satellite system and satellite terminal stations; and the Commission shall consult with the Small Business Administration and solicit its recommendations on measures and procedures which will insure that small business concerns are given an equitable opportunity to share in the procurement program of the corporation for property and services, including but not limited to research, development, construction, maintenance, and repair.

(2) insure that all present and future authorized carriers shall have nondiscriminatory use of, and equitable access to, the communications satellite system and satellite terminal stations under just and reasonable charges, classifications, practices, regulations, and other terms and conditions and regulate the manner in which available facilities of the system and stations are allocated among such users thereof;

(3) in any case where the Secretary of State, after obtaining the advice of the Administration as to technical feasibility, has advised that commercial communication to a particular foreign point by means of the communications satellite system and satellite terminal stations should be established in the national interest, institute forthwith appropriate proceedings under section 214(d) of the Communications Act of 1934, as amended, to require the establishment of such communication by the corporation and the appropriate common carrier or carriers;

57 Stat. 12.
47 USC 214.

(4) insure that facilities of the communications satellite system and satellite terminal stations are technically compatible and interconnected operationally with each other and with existing communications facilities;

(5) prescribe such accounting regulations and systems and engage in such ratemaking procedures as will insure that any economies made possible by a communications satellite system are appropriately reflected in rates for public communication services;

(6) approve technical characteristics of the operational communications satellite system to be employed by the corporation and of the satellite terminal stations; and

(7) grant appropriate authorizations for the construction and operation of each satellite terminal station, either to the corporation or to one or more authorized carriers or to the corporation and one or more such carriers jointly, as will best serve the public interest, convenience, and necessity. In determining the public interest, convenience, and necessity the Commission shall authorize the construction and operation of such stations by communications common carriers or the corporation, without preference to either;

(8) authorize the corporation to issue any shares of capital stock, except the initial issue of capital stock referred to in section 304(a), or to borrow any moneys, or to assume any

obligation in respect of the securities of any other person, upon a finding that such issuance, borrowing, or assumption is compatible with the public interest, convenience, and necessity and is necessary or appropriate for or consistent with carrying out the purposes and objectives of this Act by the corporation;

(9) insure that no substantial additions are made by the corporation or carriers with respect to facilities of the system or satellite terminal stations unless such additions are required by the public interest, convenience, and necessity;

(10) require, in accordance with the procedural requirements of section 214 of the Communications Act of 1934, as amended, that additions be made by the corporation or carriers with respect to facilities of the system or satellite terminal stations where such additions would serve the public interest, convenience, and necessity; and

(11) make rules and regulations to carry out the provisions of this Act.

57 Stat. 11.
47 USC 214.

TITLE III—CREATION OF A COMMUNICATIONS SATELLITE CORPORATION

CREATION OF CORPORATION

SEC. 301. There is hereby authorized to be created a communications satellite corporation for profit which will not be an agency or establishment of the United States Government. The corporation shall be subject to the provisions of this Act and, to the extent consistent with this Act, to the District of Columbia Business Corporation Act. The right to repeal, alter, or amend this Act at any time is expressly reserved.

68 Stat. 177.
D. C. Code
29-901.

PROCESS OF ORGANIZATION

SEC. 302. The President of the United States shall appoint incorporators, by and with the advice and consent of the Senate, who shall serve as the initial board of directors until the first annual meeting of stockholders or until their successors are elected and qualified. Such incorporators shall arrange for an initial stock offering and take whatever other actions are necessary to establish the corporation, including the filing of articles of incorporation, as approved by the President.

DIRECTORS AND OFFICERS

SEC. 303. (a) The corporation shall have a board of directors consisting of individuals who are citizens of the United States, of whom one shall be elected annually by the board to serve as chairman. Three members of the board shall be appointed by the President of the United States, by and with the advice and consent of the Senate, effective the date on which the other members are elected, and for terms of three years or until their successors have been appointed and qualified, except that the first three members of the board so appointed shall continue in office for terms of one, two, and three years, respectively, and any member so appointed to fill a vacancy shall be appointed only for the unexpired term of the director whom he succeeds. Six members of the board shall be elected annually by those stockholders who are communications common carriers and six shall be elected annually by the other stockholders of the corporation. No stockholder who is a communications common carrier and no trustee for such a stockholder shall vote, either directly or indirectly, through the votes of subsidiaries or affiliated companies, nominees, or any persons subject to

68 Stat. 191.

his direction or control, for more than three candidates for membership on the board. Subject to such limitation, the articles of incorporation to be filed by the incorporators designated under section 302 shall provide for cumulative voting under section 27(d) of the District of Columbia Business Corporation Act (D.C. Code, sec. 29-911(d)).

(b) The corporation shall have a president, and such other officers as may be named and appointed by the board, at rates of compensation fixed by the board, and serving at the pleasure of the board. No individual other than a citizen of the United States may be an officer of the corporation. No officer of the corporation shall receive any salary from any source other than the corporation during the period of his employment by the corporation.

FINANCING OF THE CORPORATION

Sec. 304. (a) The corporation is authorized to issue and have outstanding, in such amounts as it shall determine, shares of capital stock, without par value, which shall carry voting rights and be eligible for dividends. The shares of such stock initially offered shall be sold at a price not in excess of \$100 for each share and in a manner to encourage the widest distribution to the American public. Subject to the provisions of subsections (b) and (d) of this section, shares of stock offered under this subsection may be issued to and held by any person.

"Authorized
carrier."

(b)(1) For the purposes of this section the term "authorized carrier" shall mean a communications common carrier which is specifically authorized or which is a member of a class of carriers authorized by the Commission to own shares of stock in the corporation upon a finding that such ownership will be consistent with the public interest, convenience, and necessity.

(2) Only those communications common carriers which are authorized carriers shall own shares of stock in the corporation at any time, and no other communications common carrier shall own shares either directly or indirectly through subsidiaries or affiliated companies, nominees, or any persons subject to its direction or control. Fifty per centum of the shares of stock authorized for issuance at any time by the corporation shall be reserved for purchase by authorized carriers and such carriers shall in the aggregate be entitled to make purchases of the reserved shares in a total number not exceeding the total number of the nonreserved shares of any issue purchased by other persons. At no time after the initial issue is completed shall the aggregate of the shares of voting stock of the corporation owned by authorized carriers directly or indirectly through subsidiaries or affiliated companies, nominees, or any persons subject to their direction or control exceed 50 per centum of such shares issued and outstanding.

(3) At no time shall any stockholder who is not an authorized carrier, or any syndicate or affiliated group of such stockholders, own more than 10 per centum of the shares of voting stock of the corporation issued and outstanding.

(c) The corporation is authorized to issue, in addition to the stock authorized by subsection (a) of this section, nonvoting securities, bonds, debentures, and other certificates of indebtedness as it may determine. Such nonvoting securities, bonds, debentures, or other certificates of indebtedness of the corporation as a communications common carrier may own shall be eligible for inclusion in the rate base of the carrier to the extent allowed by the Commission. The vot-

ing stock of the corporation shall not be eligible for inclusion in the rate base of the carrier.

(d) Not more than an aggregate of 20 per centum of the shares of stock of the corporation authorized by subsection (a) of this section which are held by holders other than authorized carriers may be held by persons of the classes described in paragraphs (1), (2), (3), (4), and (5) of section 310(a) of the Communications Act of 1934, as amended (47 U.S.C. 310).

48 Stat. 1086.

(e) The requirement of section 45(b) of the District of Columbia Business Corporation Act (D.C. Code, sec. 29-920(b)) as to the percentage of stock which a stockholder must hold in order to have the rights of inspection and copying set forth in that subsection shall not be applicable in the case of holders of the stock of the corporation, and they may exercise such rights without regard to the percentage of stock they hold.

68 Stat. 197.

(f) Upon application to the Commission by any authorized carrier and after notice and hearing, the Commission may compel any other authorized carrier which owns shares of stock in the corporation to transfer to the applicant, for a fair and reasonable consideration, a number of such shares as the Commission determines will advance the public interest and the purposes of this Act. In its determination with respect to ownership of shares of stock in the corporation, the Commission, whenever consistent with the public interest, shall promote the widest possible distribution of stock among the authorized carriers.

PURPOSES AND POWERS OF THE CORPORATION

Sec. 305. (a) In order to achieve the objectives and to carry out the purposes of this Act, the corporation is authorized to—

(1) plan, initiate, construct, own, manage, and operate itself or in conjunction with foreign governments or business entities a commercial communications satellite system;

(2) furnish, for hire, channels of communication to United States communications common carriers and to other authorized entities, foreign and domestic; and

(3) own and operate satellite terminal stations when licensed by the Commission under section 201(c)(7).

(b) Included in the activities authorized to the corporation for accomplishment of the purposes indicated in subsection (a) of this section, are, among others not specifically named—

(1) to conduct or contract for research and development related to its mission;

(2) to acquire the physical facilities, equipment and devices necessary to its operations, including communications satellites and associated equipment and facilities, whether by construction, purchase, or gift;

(3) to purchase satellite launching and related services from the United States Government;

(4) to contract with authorized users, including the United States Government, for the services of the communications satellite system; and

(5) to develop plans for the technical specifications of all elements of the communications satellite system.

(c) To carry out the foregoing purposes, the corporation shall have the usual powers conferred upon a stock corporation by the District of Columbia Business Corporation Act.

68 Stat. 177.
D. C. Code
29-901.

TITLE IV—MISCELLANEOUS

APPLICABILITY OF COMMUNICATIONS ACT OF 1934

48 Stat. 1066.
47 USC 153.
48 Stat. 1070;
Ante, p. 64.
47 USC 201-
222, 301-397.

SEC. 401. The corporation shall be deemed to be a common carrier within the meaning of section 3(h) of the Communications Act of 1934, as amended, and as such shall be fully subject to the provisions of title II and title III of that Act. The provision of satellite terminal station facilities by one communication common carrier to one or more other communications common carriers shall be deemed to be a common carrier activity fully subject to the Communications Act. Whenever the application of the provisions of this Act shall be inconsistent with the application of the provisions of the Communications Act, the provisions of this Act shall govern.

NOTICE OF FOREIGN BUSINESS NEGOTIATIONS

SEC. 402. Whenever the corporation shall enter into business negotiations with respect to facilities, operations, or services authorized by this Act with any international or foreign entity, it shall notify the Department of State of the negotiations, and the Department of State shall advise the corporation of relevant foreign policy considerations. Throughout such negotiations the corporation shall keep the Department of State informed with respect to such considerations. The corporation may request the Department of State to assist in the negotiations, and that Department shall render such assistance as may be appropriate.

SANCTIONS

SEC. 403. (a) If the corporation created pursuant to this Act shall engage in or adhere to any action, practices, or policies inconsistent with the policy and purposes declared in section 102 of this Act, or if the corporation or any other person shall violate any provision of this Act, or shall obstruct or interfere with any activities authorized by this Act, or shall refuse, fail, or neglect to discharge his duties and responsibilities under this Act, or shall threaten any such violation, obstruction, interference, refusal, failure, or neglect, the district court of the United States for any district in which such corporation or other person resides or may be found shall have jurisdiction, except as otherwise prohibited by law, upon petition of the Attorney General of the United States, to grant such equitable relief as may be necessary or appropriate to prevent or terminate such conduct or threat.

(b) Nothing contained in this section shall be construed as relieving any person of any punishment, liability, or sanction which may be imposed otherwise than under this Act.

(c) It shall be the duty of the corporation and all communications common carriers to comply, insofar as applicable, with all provisions of this Act and all rules and regulations promulgated thereunder.

REPORTS TO THE CONGRESS

SEC. 404. (a) The President shall transmit to the Congress in January of each year a report which shall include a comprehensive description of the activities and accomplishments during the preceding calendar year under the national program referred to in section 201(a)(1), together with an evaluation of such activities and accomplishments in terms of the attainment of the objectives of this Act and any recommendations for additional legislative or other action which the President may consider necessary or desirable for the attainment of such objectives.

August 31, 1962

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Pub. Law 87-624

76 STAT. 427.

(b) The corporation shall transmit to the President and the Congress, annually and at such other times as it deems desirable, a comprehensive and detailed report of its operations, activities, and accomplishments under this Act.

(c) The Commission shall transmit to the Congress, annually and at such other times as it deems desirable, (i) a report of its activities and actions on anticompetitive practices as they apply to the communications satellite programs; (ii) an evaluation of such activities and actions taken by it within the scope of its authority with a view to recommending such additional legislation which the Commission may consider necessary in the public interest; and (iii) an evaluation of the capital structure of the corporation so as to assure the Congress that such structure is consistent with the most efficient and economical operation of the corporation.

Approved August 31, 1962, 9:51 a.m.