PROJECTS COMPLETED BY STUDENTS OF THE NATIONAL LEADERSHIP TRAINING PROGRAM IN THE AREA OF THE DEAF

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Volume I

THE TTY

A MEANS OF COMMUNICATION

by

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This paper attempts to develop a rationale for the development of equal access to telephone communications for people who cannot use the present telephone system without specially adapted TTY equipment.

The author has traced the development of various systems purported to answer the needs of deaf people in using the telephone. He points out the frustrations encountered by people who have used these systems and indicates actions which can be taken to aleviate the inequality of telephone service in the United States.

The Rehabilitation Act of 1973 and the ammendments to that Act form the legal basis for recommendations to improve telephone communications for people who can neither hear nor speak.

The possibility of favorable interpretation of the Architectural Barriers Act of 1968 regarding equal access to telephone communications is presented through the eyes of a lawyer employed by the United States Government.

Recommendations for further study of the responsibilities of telephone companies, tax supported agencies, and the media are made in the hopes that they will be pursued toward the goal of equal access to telephone communications for people who can neither hear nor speak.

TABLE OF CONTENTS

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My appreciation and thanks are also extended to Dr. Ray Jones for his interest and assistance in this project.

INTRODUCTION

Having worked as a rehabilitation counselor for three and one half years with people who cannot hear or speak has made me aware of some of the frustrations these people encounter in their daily lives. The most basic frustrations stem from a lack of communication with people. One segment of this communication problem is directly related to use of the telephone.

This paper does not contain a panacea to the problem nor does it present the TTY system as the only or best method of distant one to one communication. It proposes the fact that there are systems available today that will meet the telephone communication needs of the majority of people who cannot hear or speak. While more efficient systems are being developed, this process of utilizing present TTY systems can be effectively introduced with little or no delay.

The general term TTY is used to denote telephone communications equipment which permits people to type their messages to each other by means of specially adapted teletypewriters, or the various self contained units described on pages 12-13.

Of the more than 13 million citizens of the United States who have differing degrees of hearing impairments, 1.8 million are deaf. Deafness here being defined as

"...those persons who could not hear and understand speech and who had lost (or never had) that ability prior to 19 years of age."[1] Figures were not obtained on the number of people who became deaf after 19 years of age, nor on the number of people who are unable to use the phone for reasons other than deafness. Included in this latter population are people with various degrees of cerebral palsy, muscular diseases such as dystonia and other voice control problems.

Instead of being able to pick up the phone and call directly to an office, be it police, fire, telephone company, health department, or legislator, the person who cannot hear or speak must find a third party who is hearing and willing to call for them. Should that avenue of approach fail, the person must walk, use vehicle transportation to and from the place of contact, or write a letter. All of these methods are expensive in terms of time, energy and money when compared to the immediacy of one to one conversation via the telephone.

In many instances the person's tax monies are supporting agencies which have no provision for telephone communications with them. It appears to be logically and legally feasible that services in kind are due tax payers for their financial support of these agencies.

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1. Jerome D. Schein and Marcus T. Delk, Jr., The Deaf Population of the United States (Maryland: National Association of The Deaf, 1974), p. 2.

This paper will present attempts of the past and present to equalize access to telephone communications for people who cannot hear and speak. These attempts include inventions of communication devices, organizations of specialized interest groups and Congressional legislation.

Recommendations for further action will be made in the hope of tapping the resources available in this population of more than 220 million people.

METHODOLOGY

The information contained in this paper was gathered from published literature, personal involvement in meetings, personal interviews, written correspondence, and reference to unpublished works available through the Center on Deafness Library at California State University, Northridge. Reference to two major pieces of legislation (The 1973 Rehabilitation Act, PL 93-112 and the Ammendments to that Act PL 93-516) form the legal basis of recommendations made for improved telephone communications, for deaf citizens of the United States.

Consideration of technological and legislative efforts of the past and present will lead to recommendations of future action. It is hoped that these recommendations do their part in providing a telephone communication situation which will serve the hearing and speech impaired citizens of this country.

REVIEW OF LITERATURE

In the 1940's Bell laboratories developed a system called "visible speech"[2] which in essence was a sound spectrograph that displayed images of voice and word patterns. It was hoped in the early stages of development that the visible speech system would permit deaf people to have improved telephone communications. The display was not easily understandable, demanded much training and was costly.[3] Through the 1960's research continued at Wayne State University Speech and Hearing Clinic. The system developed into a speech training device, and was never produced on a commercial basis for telephone communicative use.

Use of the cathode ray oscilloscope was advertised in an article by Gale M. Smith of the Bell System in 1963.[4] This device used a code system for communication, either Morse or another pre arranged system. The deaf person "saw" the telephone ring via electrical impulses on the screen of the oscilloscope or by means of a flashing light system. If the deaf person was able to speak they would take the

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2. Ralph K. Potter, George A. Kopp and Harriet Kopp, Visible Speech (New York: Dover Publications, 1966) p. v.

3. Gale M. Smith, "Telephone Service for the Totally Deaf" Volta Review, Vol. 65, December 1963, pp. 579-83.

4. Ibid.

initiative in the conversation and ask questions which would elicit a "yes" or "no" response. If the deaf person could not speak, his conversation was limited to coding with a person who understood the particular code in use. The major difficulty arose when a person wished to communicate with a friend or stranger who did not know the code.

> "There's not much a deaf person without speech can do in this event, unless he can afford a laboratory wonder wuch as a speech synthizer, or a computer programmed to spell out pre-recorded words when words are typed into the input."[5]

A modified version of this unit was a light signal installation which performed the same function as the oscilloscope and was followed up with a tactile receiver which vibrated for the person who was deaf and blind. These systems were available for installation by the phone company and were permanent to that installation.

In January of 1964 an experimental phone call was made between California and Washington D.C., using the #Data-Phone" a product of the Bell System. Instrumental in setting up this event were Dr. Ray Jones, Director of the Leadership Training Program in Deafness at California State University, Northridge and Mary Switzer then Commissioner of Vocational Rehabilitation. This system linked the "Electrowriter" and "Data-Phone" systems to an existing

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5. Ibid., p. 581

teletypewriter and enabled the communicants to write out their messages to each other instantaneously.[6] Though the Pacific Telephone company had tariffs approved to provide "phone writing" equipment for deaf people,[7] the idea never materialized into a viable system.

The "picture phone" developed by Bell labs was exhibited in 1964 with a conversation between deaf persons in New York, Washington D.C., and Chicago.[8] The cost at that time was between sixteen and twenty seven dollars for the first three minutes. A year later the cost was reduced to half that amount but was still too costly for the individual consumer.

Other devices, such as the "Code-Com" developed by American Telephone and Telegraph, were installed on the phone of the subscriber and useful only to those specific phones to which they were attached.[9]

Until 1964, there was no functioning, portable low cost system which would enable a deaf person to use the

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6. "Deaf Students Talk, 'Hear' In Historic Telephone Call," The News, January 28, 1964 Van Nuys, California.

7. Coverstory, "Deaf Exchange Ideas Over Telephone Lines," Telenews, A Newspaper for Pacific Telephone People. Vol. 15, No. 3, February 20, 1964.

8. Smith, op. cit., Vol. 66, October 1964, p. 621.

9. Steven L. Jamison, "Telephone Equipment For Deaf People - A Survey," article to appear in 1975 Deafness Annual of Professional Rehabilitation Workers With the Adult Deaf.

nearest telephone by himself. The systems available were either too costly, or demanded special arrangements with the telephone company for installation into a specific phone. The deaf person on the street had no possible way of using the numerous telephone within easy reach.

In the Fall of 1964 Mr. Hugh Moore, then Electronics Specialist with Los Angeles Valley College and now Associate Dean of Industrial Education at that College , developed the "Speech Indicator".[10] This compact device no larger than a package of cigarettes enabled a person with understandable speech to use any telephone independently. A suction cup which adhered to the outside back of the ear piece of any telephone, picked up sound and transmitted it through a magnetic system onto a dial indicator on the face of the device. By reading the responses from the other party, the deaf person would receive answers of "No", "Yes" and "Please repeat". A "No" answer would be indicated by the needle deflecting once, a "Yes" answer by two deflections, and "Please repeat" by three deflections. Deflection could be accomplished in various ways but the clearest method was by blowing into the speaker or tapping on the speaker with a hard instrument.

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10. "Speech Indicator Manual". A 39 page booklet with photographs and instructions in the use of the device is available through the Center on Deafness at California State University, Northridge.

Extensive testing of this device was done through the Leadership Training Program in the Area of Deafness at California State University, Northridge. At that time the University was known as San Fernando Valley State College. More than 500 of the "Speech Indicators" were disseminated throughout the deaf population. No precise figures on the actual usage of them today is available. In 1966 a tactile version of the "Speech Indicator" was developed for persons who were deaf and blind. This version was field tested at the National Center for the Deaf-Blind in New York.

In the mid 1960's a major breakthrough was accomplished in telephone communications for people who could neither hear nor speak. Mr. Robert H. Weitbrecht, a deaf physicist, developed a coupler which enabled existing teletypewriters to communicate with each other without the use of direct special wiring and through the existing lines of telephone service. With the invention of the "Phonetype" acoustic coupler in 1965, Mr. Weitbrecht opened up the possibility of direct communication via the telephone, at a reasonable cost for people who could neither hear nor speak. Since the teletypewriter was in existence and able to be used as the basic terminal for conversation, the acoustic coupler permitted direct typed conversations using the telephone lines as the transmission mode. In essence the teletypewriter is a telegraph system similar in appearance and operation to a typewriter but with a built in code

which transmits sound frequencies into electrical impulses which activate the keys of the machine and print out the message.[11]

The Bell System converted to direct distance dialing from the TWX (Teletypewriter Exchange Service) in 1962. This meant that people with a teletypewriter and connected acoustic coupler could call each other directly without going through an operator's switchboard, thus eliminating the need to rely on a third party hearing person to translate to the operator.

With the invention of the acoustic coupler many problems were tentatively solved, such as the need for understandable speech, the training of persons in the use of codes, and the limitations of specially installed equipment. The problems of availability of equipment, manufacture at a reasonable cost, and distribution were very new and real problems.

In 1968 TDI (Teletypewriters For The Deaf Incorporated) was founded for the purpose of coordinating the acquisition and distribution of surplus teletypewriters to deaf people. Being a non-profit agency TDI entered into agreements with various telephone companies, Western Union, governmental agencies and private companies to secure surplus TTY (teletypewriter) equipment for distribution

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11. "Proceedings of the First National Conference of Agents of Teletypewriters For The Deaf Inc." November, 1971 Indianapolis, Indiana. p. 21.

among the deaf population. Within three years, membership in this organization grew to more than 1,500 people with 54 authorized agents.

Throughout the country groups of deaf people began to organize TTY organizations to facilitate telephone communications among themselves and with the hearing population who were a part of their lives but out of touch through telephone lines. Finally, after nearly 100 years of anxiety and frustration, the possibility of direct, immediate communication via the telephone had become a fact of life for people who could neither hear nor speak. This fact of immediate communications had limits however. As long as the person had a TTY he could communicate with any other person who had similar equipment. The cost ranged from almost nothing to over $700.00, depending on where the person lived, if he was aware of donated equipment, and if he had to purchase the machine new and have necessary adjustments made.

Anxiety and frustration set in with the realization that communication to emergency centers such as police, fire and ambulance service were not available. The realization that communication with a family member once out of the home was not possible added to this age old problem. Developments which first seemed to answer the communication problems, once again impressed upon the deaf person the realization that the telephone was still a barrier to him.

With the advent of the TV-Phone[12] some degree of portability was introduced into the TTY network. This unit unlike all previous TTY models does not produce a hard copy (printed page) of the conversation, but does display eight lines of up to 32 characters per line on a TV screen (any working TV with a free channel). Replay of conversations or prerecording of a message is accomplished via a separate cassette tape recorder available from the company.

In 1973 the MCM (Manual Communications Module) was introduced,[13] permitting deaf persons for the first time in history the opportunity to carry a light, self contained, rechargeable battery operated TTY system and use that system in any telephone booth or public telephone counter. This also enabled a person leaving the home with an MCM to remain in contact with family members who had a TTY system in the house.

Like the TV-Phone, the MCM does not produce a hard copy of the conversation, but a tape cassette is available for pre or post conversation recording. The display unit is a 32 position register which reads from left to right with the letters of the words coming across from right to

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12. Phonics Corporation, 814 Thayer Avenue, Silver Spring, Maryland 20901.

13. Silent Communications, Inc., 1440 29th Avenue, Oakland, California 94601.

left, similar to the Times Square display. Regularity of the appearance of the letters and words depends on the fluency of the person typing or TTYing.

Since the appearance of the TV-Phone and the MCM, two other models of self contained TTYs have come on the market. The "Magsat",[14] similar in style to the MCM and the "Interpreter"[15] a hard copy self contained unit looking almost identical to an electric typewriter. Both of these systems are compatable with the previously described TTY systems.

These products on the market today permit accessable telephone communications for people who can neither hear nor speak. The important question that must be answered is, " how do we assure accessability to these systems for the people who need them?" People who can neither hear nor speak still face the basic problems of isolation and communication barriers even with the presence of these various communication devices. These systems are of no value if the cost of purchase, use and maintenance is prohibitive to the speech and hearing impaired consumer.

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14. Magsat Corporation, 151 Vanderbilt Avenue, West Hartford, Connecticut 06110.

15. Interpretive Systems Corporation, 1730 West La Palma Avenue, Anaheim, California 92801.

THE REALITY OF 1975

Three major problems exist today regarding TTY equipment for people who can neither hear nor speak.

1. High cost of purchase, maintenance, and use.
2. Lack of availability of equipment
3. Lack of installation by business and tax supported agencies.

The initial cost of purchase and installation of TTY equipment is approximately 13 times that of regular telephone installation, ($18.00 vs. $240.00). The high cost of new equipment is prohibitive to most people, ($450.00 - $1,000.00). Understandably, the majority of TTYs in use today are the older hard copy models which have been donated to TTY groups for rebuilding and repair. It is not uncommon for TTY owners to take courses in TTY repair to lower the cost of maintenance. Another expense for the hard copy TTY user is the purchasing of paper which the machine prints on. The owners of the self contained portable units do not have the paper expense but they must purchase from t the companies, special tape recording devices if they want to pre or post record messages. Maintenance is covered through a warrantee or service contract. Repair of the portable units is done by the manufacturer and is often time consuming.

The present rate of maximum transmission on the TTY is 60 words per minute. The accepted average rate of spoken words in conversation is in the area of 150 words per

minute. At best, the rate of typed words to spoken words in telephone conversation is 1:3. The implications this has in terms of cost for long distance calls is apparent. Thus, from the time of purchase, during use and during maintenance the TTY is an expensive proposition.

For the person who cannot afford new equipment, his chances of obtaining repaired used equipment are remote due to the realities involved. These include sheer numbers of people wanting TTY equipment to converse with their families and friends, lack of information on where and how to purchase used equipment and lack of equipment itself. Most people who can ill afford the purchase of new equipment must be put on a waiting list for machines available at lower costs. It is not unusual for people to wait a year or more to become eligible to purchase a repaired machine.

The demand for TTY equipment is not limited to the hearing impaired population.[16] As you recall, a TTY system is operable only when it is transmitting to another similar system. In order for a person who uses the TTY to contact another family member in a different household, that other household needs a TTY system. When hearing members of a family want to contact a father, mother, sister, or brother who cannot use the telephone, they are in the same situation

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16. F.A. Caligiuri, "The Telephone and The Deaf," An Unpublished article available through the Center on Deafness, California State University, Northridge California.

as the person who is deaf when it comes to using the phone. If they do not have a TTY they must call a neighbor, go see someone who has a TTY and ask to borrow its use, or get in the car and drive to the family member's house. Depending on the size and distribution of the family, the cost of telephone communications increases directly in proportion to the number of different households which make up that family unit.

The third major problem which still exists today is the lack of installation of TTY equipment by business and tax supported agencies. Most citizens who are deaf cannot contact the police, fire departments, hospitals or other emergency agencies directly through use of the telephone. They cannot contact elected officials' offices, the motor vehicle department, dog catcher or recreation center. In most instances they cannot contact any agency which their tax dollars support. In those rare instances where tax supported agencies have installed TTY equipment, the driving force has been the deaf community and often times the equipment has been donated free of charge.

Two fallicies emerge here, the first of which is the most difficult to deal with. The misconception of people in these agencies that they are doing the deaf population a favor and should receive praise for installing equipment necessary for basic communication is an unconscious and unintentioned slap in the face to people who are deaf. Secondly, the effort for equal services is originated and

paid for by the deaf members of the community in terms of time, energy and money, when those same services are automatically provided the hearing members of the community.

In 1971 Lee Brody estimated that the Bell System increased its gross revenue by approximately one million dollars a year with no capital investment due to the growth of the TTY system among deaf people.[17] At that time there were approximately 2,000 TTYs in operation throughout the country. Today there are more than 10,000 TTYs in operation serving the deaf population.

Recently three of the 1800 separate telephone companies in the United States have installed TTYs for their deaf customers, Northwestern Bell in Minneapolis, Indiana Bell in Indianapolis,[18] and Pacific Telephone in the San Fernando Valley in California.[19] These installations are for business purposes such as wrong numbers, billing, information on service, equipment changes and repairs. The Chesapeake and Potomac Telephone Company of Washington D.C., plans to install a TTY system in their credit office to provide multiple services to deaf customers in that area.

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17. "Proceedings of the First National Conference of Agents of Teletypewriters For the Deaf Inc." op. cit., p. 50.

18. "GA-SK," February, 1975. A periodic newsletter of Teletypewriters of the Deaf Inc., Indianapolis, Indiana.

19. Gauthier, R.K., Division Manager of Pacific Telephone Company, Los Angeles Sector. Customer Letter Dated June 5, 1975.

It is unknown if these companies intend to provide directory and operator assistance as part of the service. These situations are more examples of pressure results from the deaf community rather than an active program of service by public utilities.

Perhaps the reason more attention has not been given to telephone service for people who are deaf is due to the lack of visibility and knowledge of their existence. It was not until publication of the National Census of the Deaf Population in 1974 that reliable national estimates on the numbers of deaf citizens were available. Previous to the publication of the Census the most accurate national statistics were those of the United States Census Bureau in 1930 which estimated 47 deaf persons per 100,000 population. The new accepted prevelance rate in the United States is 203 deaf persons per 100,000 or almost five times the old estimate.[20]

With increased numbers of deaf people continuing their education past the secondary level and into the college and graduate levels, there necessarily is more exposure to the hearing population and an increased need of communication with the hearing population.

Through exposure on our campuses, technical schools, colleges and universities a dual educational process takes place. The deaf student is competing with hearing peers

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20. Schein, op. cit., p. 15.

and this competition provides an opportunity for mutual contact and recognition of abilities. The person who can neither hear nor speak is being recognized not as 'deaf and dumb' or 'deaf mute' or 'deaf' but as a human being who happens not to be able to hear.

The development of working relationships with people is severely limited by the inability to use the telephone. Contact with fellow students during studies and after graduation in a work setting is stymied by the lack of accessable telephone communications. Through no fault of their own, deaf citizens are being barred from further sharing their knowledge and abilities with other people.

Consider for a moment this statement from a person twenty seven years old who is communicating for the first time with a TTY. "This is great....It has made a beautiful change in my life, now I can use the telephone like other people."[21] Fortunately in this persons locale the police have a TTY system, as does a nearby library and a large portion of the deaf community. However, the vast majority of tax supported agencies and businesses remain isolated from the deaf community when telephone communications are considered. For these people and the vast majority of deaf citizens in cities throughout the United States, their dream of equal access to phone communications is yet to be realized.

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21. Quote from a personal TTY conversation with a deaf person while working as a Rehabilitation Counselor.

RECENT LEGISLATION

Recent legislation has begun to focus attention on services for the hearing impaired citizens of this country. The Congress of the United States has demonstrated its awareness of the burden a severe hearing loss imposes on a person by passing the Rehabilitation Act of 1973 and the Ammendments to that Act in 1974. In its report dated November 26, 1974 the Committee on Labor and Public Welfare (Calendar #1230 Report #93-1297) stated:

> The Committee is well aware that technology exists which would enable many individuals with handicaps to take advantage of transportation, communication, and educational systems. The Committee has directed its attention to this area under the Rehabilitation Act of 1973. While it is true that we need continued research in these areas, it is also true that we must begin to use existing knowledge much more effectively. p. 57. (Emphasis added.)

A portion of the technology that exists today in communication systems has been referred to earlier in this paper. As the Committee on Labor and Public Welfare states, we have not begun to put those systems to use effectively. One way in which effective use of existing knowledge and systems can be put to use is by the Federal Government installing TTY systems in its various agencies.

In the metropolitan Washington D.C., area as of May 1975 the following Federal agencies and offices had installed at least one TTY. Some of these installations were for the benefit of employees who are deaf, and others for deaf citizens who wish to communicate by phone for

various reasons.[22]

Government Printing Office
Internal Revenue Service
Department of Health, Education and Welfare
Consumer Product Safety Agency
National Advisory Committee on Education for the Deaf
Library of Congress
Veterans' Administration
General Services Administration
The Pentagon
National Bureau of Standards
National Oceanic and Atmospheric Administration
U.S. Geological Survey
Educational Media Distribution Center
Smithsonian Institute
Naval Research Laboratory
General Accounting Office

The Department of Agriculture, Defense Mapping Agency and National Security Agency are considering installation of TTY systems in the near future.

Under section #302 of its November 26, 1974 report, the Committee on Labor and Public Welfare authorizes the President to call a White House Conference on handicapped individuals and also authorizes participants in that conference to consider;

> "all matters related to providing a national assessment of problems facing individuals with handicaps and making recommendations for the solutions to such problems...."

Among the 17 primary areas of consideration was number 4, which reads; "enabling individuals with handicaps to have

> <u>access to usable communication services and devices at costs comparable to other members of the population.</u>" (Emphasis added).

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22. Personal note from Louis J. Schwarz, President of The Deaf Telecommunicators of Greater Washington D.C.

Development of accessable telephone communications for people who are deaf can be taken as a directive from the three major areas of concentration in the Rehabilitation Act of 1973.

> 1. The development of new and innovative methods of applying the most advanced medical technology, scientific achievement, and psychological and social knowledge to solve rehabilitation problems and provide rehabilitation services to handicapped individuals. 29 (USCA 701 (5)).

The TTY is an innovative method of providing rehabilitation services to handicapped individuals. The TTY can be viewed as a rehabilitation service in and of itself since rehabilitation services are defined as, "any goods or services necessary to render a handicapped individual employable." (29 USCA 723 (a)). In this same section of the federal regulations, telecommunication aids and devices are included in the definition of rehabilitation services.

> 2. The promotion and expansion of employment opportunities in the public and private sectors for handicapped individuals. (29 USCA 701 (8)).

The TTY can and has expanded employment opportunities for deaf people by permitting direct contact with agencies who have them installed and permits continued contact with an employer once a person is on the job. The use of the telephone is vital in many jobs and with a TTY installation, deaf people can function on an equal basis with hearing people when the duties involve telephone communications.

> 3. The evaluation of existing approaches to architectural and transportation barriers confronting handicapped individuals, the development of new ways to lower such barriers and the enforcement of statutory and regulatory standards regarding barrier-free construction of public facilities.... (29 USCA 701 (11)).

It is the opinion of at least one lawyer that lack of access to telephone communications constitutes an architectural barrier as defined in the Architectural Barriers Act of 1968 and the 1970 ammendments to that act, (42 USCA 4251).[23] Mr. Price states; ...telephones must be

> viewed as a structural part of public buildings. If a person is denied access to the telephone in the building, then an architectural barrier confronts him. The Board is empowered to take steps to eliminate such architectural barriers. This could be achieved through the use of the TTY. The legislative history may be construed to support the above position. The legislative history of the 1968 Act (U.S. Code Congressional and Administrative News 1968 at 3214, 792) reflects concern that public buildings be constructed so that they are accessable to and usable by the physically handicapped. If one cannot utilize the telephone network within the building, one does not have access to that building. The more recent edition makes it clear that the Compliance Board should eliminate many categories of environmental barriers which now severely impede the mobility, the employment and the recreation of handicapped people. (1975 U.S.C.C. AN at 7516.)[24]

Since telephones are such an integral part of our daily living, it is the opinion of Mr. Price that they can be considered part of the environment, and being thus considered are among the barriers to deaf people who are

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23. Stanton J. Price, "Memo To Members of the Greater Los Angeles Association of the Deaf," May 5, 1975.

24. Ibid., p. 3.

considered members of the severely handicapped population of the United States.

As was stated by Martin L. LaVor, Minority Legislative Associate of the Education and Labor Committee and Mr. Jack C. Duncan, Counsel to the Select Subcommittee on Education, U.S. House of Representatives; "The emphasis appears to have shifted from services based on charity or moral grounds to services as a matter of right."[25] With the passage of the Rehabilitation Act of 1973 and the ammendments to that Act, there is now a legal basis upon which demands for equal access to telephone communications can be made for people who are citizens, albeit deaf.

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25. Martin L. LaVor and Jack C. Duncan, "Rehabilitation Act of 1973, P.L. 93-112" Exceptional Children, March, 1974, p. 449.

SUMMARY

Since the time of its patent in 1876 the telephone has been developed into a sophisticated piece of communication equipment for people who hear and speak. Despite inventions which make telephone usage available to people who are deaf, the vast majority of people who can neither hear nor speak do not have equal access to its use. The basic reason for this lack of equal access is the few numbers of TTY systems in use within the deaf population and the near total absence of reciprocal TTY systems in tax supported agencies and businesses in the United States. A major factor involved in the relatively few numbers of TTYs is the cost of purchase, maintenance, and use. The reason why so many tax supported agencies do not have TTY systems is a combination of ignorance of the need and the low visibility of the deaf population.

The need and legal right to accessable telephone communication is becoming more apparent to the population in general. With the passing of the Rehabilitation Act in 1973 and the ammendments to that Act in 1974 a statutory basis of right to barrier free access to public and tax supported agencies has been established.

RECOMMENDATIONS

In accordance with the Rehabilitation Act of 1973 and the ammendments to that Act, every rehabilitation office in the country should have a TTY system to permit direct access for people who need the TTY system as a means of phone communication.

State rehabilitation agencies should provide TTY equipment to clients who cannot use the telephone without adaptive TTY equipment, on the basis of need for independent living and not solely on the TTYs relation to employment.

The Rehabilitation Act of 1973 emphasizes the use of present systems and devices and recognizes the need of further research into the development of devices and services which will enhance the independent living of all handicapped people. Therefore, a comprehensive study subsidized by Rehabilitation Services Administration should be undertaken to indicate the effect of immediate equal telephone access on the lives of those people presently unable to use the telephone system without adaptive TTY equipment. Specific areas of concern in this study should include education, social life, and working situations.

Professional organizations of the deaf and speech impaired should initiate federal, state, and local action to insure equal access to tax supported agencies via the telephone.

The Bureau of Education for the Handicapped should initiate research into the possibilities of utilizing the TTY system in the home and school as an educational tool in connection with computerized programs.

Federal investigations should begin into the responsibilities of AT&T and its subsidiaries as public utilities, regarding equal access to telephone communications for people unable to use the present system without special adaptive equipment.

Investigate the possibilities of emergency news services in cooperation with local television and radio stations. Investigate the responsibilities of such enterprises in making this information available to people who cannot receive the information through regular channels.

Increase cooperation among and between national associations concerned with problems of telephone communications.

Initiate research by government grant if necessary into the possibilities of lowering the cost of TTY equipment for purchase, maintenance and repair.

Develope methods of utilizing used equipment at costs that are bearable to the consumer who can neither hear nor speak.

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