

Deaf And Hearing-Impaired Services
Telecommunication Services For The Deaf

Notice of Inquiry in the matter of telecommunication services for the deaf and hearing-impaired issued. Comments should address the need for new services, standards, and research and development. Also the success of current and feasibility of new services should be considered.

F.C.C. 78-82

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

In the Matter of

TELECOMMUNICATION SERVICES FOR THE
DEAF AND HEARING-IMPAIRED

CC Docket No.
78-50

NOTICE OF INQUIRY

(Adopted: February 8, 1978; Released: February 13, 1978)

BY THE COMMISSION: COMMISSIONER LEE ABSENT; COMMISSIONER
WASHBURN ISSUING A SEPARATE STATEMENT.

1. It is estimated that there are more than thirteen million people with impaired hearing in the United States.¹ For some, particularly the deaf, the inaccessibility of the telephone and other two-way communications services creates barriers to normal human interactions customarily taken for granted by the non-impaired sector of society. However, new technological developments in telecommunications, electronics and computer processing capabilities may make it possible to provide better means of communication using the telecommunications network through the introduction of new services and equipment currently not available. Under the Federal Communications Commission's mandate to regulate communications "... so as to make available, so far as possible, to all the people of the United States a rapid, efficient, nationwide, and world-wide wire and radio communications service . . .",² the Commission seeks to determine the current status of telecommunications services for the deaf, the communications needs of the deaf and hearing-impaired that are not currently being met, and how modern technology and other resources can be utilized in the communications sector to meet these needs.³

2. The primary objective in instituting this inquiry is to provide a nationwide forum whereby communications common carriers and other

¹Jerome D. Schein and Marcus T. Delk, Jr., *The Deaf Population of the United States*, National Association of the Deaf (1974), p. 4, "National Census of the Deaf Population" (1971). Throughout this Notice the terms "deaf" and "hearing-impaired" are used interchangeably.

²47 U.S.C. § 151.

³This inquiry does not address mass communications services for the deaf, such as the use of the vertical blanking interval of the television broadcast signal (addressed in Docket No. 20693, 63 FCC 2d 378 (1976)) or the use of the SCA subcarrier of an FM broadcast station.

vendors of communications related equipment can interact with the deaf community in order to better understand their communications needs. In addition, the creation of a comprehensive record in this area will be of assistance to the Commission in formulating any policies or rules that may ultimately evolve from this or subsequent proceedings.⁴

Existing TTY System for the Deaf

3. Currently, the primary means of electronic communications available to a deaf individual is the TTY system. The abbreviation "TTY" has traditionally stood for "teletypewriter," and the TTY system employs a class of such terminals which operate on a dial-up basis over the public switched telephone network. The TTY system was developed initially by members of the deaf community because the telephone companies did not offer a service to meet their needs. In 1964 a deaf orthodontist and a deaf engineer designed a system which would allow the use of TTY terminals over the public telephone network. An essential feature of this system was the development of a modem which allowed TTY terminals to be acoustically coupled to the network. Initially, TTY terminals had been almost exclusively surplus or obsolete teletypewriters, donated by the Bell System, Western Union Telegraph Co., and the International Record Carriers.⁵ More recently, a wider range of terminals incorporating modern technology has been developed and marketed for use by the deaf; and it is estimated that there are 15,000-20,000 TTY terminals currently in use.⁶

4. In spite of the application of new technology, however, the inherent limitations of the existing TTY system appear to render it less than optimal, both in terms of an efficient utilization of the communications channel and meeting the needs of the deaf community. The TTY system has two serious drawbacks. First, the terminal equipment used by the deaf is incompatible with standard computer equipment used in the provision of communication services. Second, because it results in the transmission of data over the network at very low bit rates, the system makes very inefficient use of the telephone network. The compatibility problem arises because neither the teletypewriter terminal nor the modems used by the deaf incorporate data communication standards. The TTYs used by the deaf are "5 level Baudot" machines which utilize a standard that, while being compatible with international Telex standards, is not compatible with TWX or data communications standards which utilize an "8 level ASCII" code. In addition to the basic incompatibility of terminal devices, the modems used in this system are incompatible with modems used in data communications. Most data communications services use the four frequencies standardized in the Bell 103-type modem, while the modems designed in 1964 for the deaf use different frequencies. This incompatibility in modem frequencies, and the Baudot/ASCII incom-

⁴ On December 30, 1977, the National Center for Law and the Deaf (NCLD) filed a "Petition for Rulemaking," which, in essence, seeks to have the Commission institute an inquiry into matters raised herein and to adopt such rules as are deemed necessary. Rather than establishing a separate proceeding, the issues raised in NCLD's petition are incorporated into this Inquiry. We leave to another proceeding the adoption of specific rules in this area, should we find that a need exists.

⁵ A non-profit organization called Teletypewriters for the Deaf, Inc. was established to act as a clearing-house to recondition such machines and make them available to the deaf.

⁶ On December 15, 1976 the Commission issued a Public Notice announcing the installation of a "TTY phone" in the Commission's Consumer Assistance Office.

patibility prevents TTY users from taking advantage of whatever benefits might flow from being able to communicate with people or entities using modern data communication terminals. The second limitation of the TTY system lies in the fact that because it operates on a dial-up basis it is necessary to maintain the connection between two TTY terminals while the users slowly type out their messages. While these factors may render use of the TTY system less than optimal, the question arises as to whether these limitations are of such a nature that they serve to impose an unreasonable burden on either the TTY user or the telephone network.

5. This leads us to inquire as to whether modern technology can be utilized in providing new and innovative communications services which do not have the apparent limitations of the existing TTY system. Computer technology has added a new dimension to the telecommunications industry and already has had a profound impact in terms of the provision of new and innovative communication services as seen, for example, in the development and use of packet switching in certain communication networks. Whether sophisticated computer technology can be applied to the specific needs of the deaf remains to be seen. To the extent that there are limitations inherent in the existing TTY system, attention should be given to whether applications of computer technology could be utilized to overcome these limitations and yield more flexible communications services for the deaf and hard of hearing. In an attempt to provide a forum for the expression of views in this area, we invite comments on the possible applications and benefits of modern computer technology in the provision of new and innovative communication services for the deaf.

6. In the long run there may be electronic message services which more fully meet the needs of the deaf. If for the near term, however, the TTY system is to be the primary means of electronic communications available to the deaf, it becomes appropriate to inquire as to whether users of the TTY system should be provided supporting services which are normally provided to non-deaf customers, such as: operator assistance, directory assistance, business office assistance, recorded messages, and pay TTY terminals in public locations. Comments are sought as to the feasibility, need or other justification for the provision of such services to deaf customers. Moreover, due to the absence of telephone industry offerings of TTY terminal/modem combinations that are compatible with the existing TTY system, comments are also sought on whether there are currently any legal, contractual or regulatory barriers to the telephone industry's offering of TTY terminals and appropriate modems which are compatible with the existing TTY system. Comments should also address whether a need exists for the provision of such services, and whether the telephone industry has any offerings or current plans for new or similar offerings in the future.⁷

⁷ Without entering into a discussion of the boundary between deafness and hearing impairment, we note that the hearing-impaired may have a range of choices currently available, including amplified handsets and hearing aids with a telephone pickup feature that operate by means of electromagnetic leakage. The Bell System, GT&E, and other independent telephone companies are requested to provide updated information for the record in this proceeding which describes their plans for accommodating hearing aid users. Comments are also sought on the need to establish standards such as electromagnetic leakage, in the manufacturing of telephone handsets (telephone company provided and customer owned), or some other standard such as handsets designed with jacks capable of accommodating hearing devices used by the hearing-impaired.

Preferential Rates

7. Various interests within the deaf community have argued⁸ for lower rates for deaf users of TTYs over the interstate public telephone network. This is based on recognition that a voice customer can communicate information faster than can a TTY customer using the currently available TTY system and equipment. For interstate toll service the deaf user is charged by the minute; however, he or she communicates more slowly than voice telephone users. This may result in higher toll charges for deaf users than for other users. It has been argued that this has a discriminatory effect which should be remedied through preferential rates for deaf users of TTYs over the interstate toll network.⁹

8. The reason advanced for establishing preferential rates for deaf users of the TTY system is to alleviate an economic constraint that may, in some cases, foreclose usage of the system. The argument is made that the usage sensitive nature of the interstate toll charges, in conjunction with the longer duration of a TTY call, inhibits the use of the TTY system. If this should be found to be the case, the establishment of preferential rates for interstate toll service would be a possible method of alleviating any unreasonable economic inequities accruing to the TTY user which serve to inhibit his or her use of the system. The issue of the need and justification for preferential rates should be addressed by the comments in this inquiry.

9. From the Commission's perspective it is important to first determine what constraints, if any, the interstate MTS toll structure imposes on the ability of the deaf to use the TTY system. If an unreasonable constraint should be found to exist, we invite comments on whether the Commission should take some action on its own or whether the problem is of a nature which should be addressed by Congress rather than by this Commission. Those comments addressing possible preferential rates should address the adverse effects, if any, upon the remaining ratepayers in the form of higher rates, as well as possible benefits that might accrue to the deaf community in terms of increased accessibility and usage resulting from lower rates. In this regard studies or estimates of the demand for TTY service and the impact preferential rates would have on carrier revenues should be submitted where available. In addition, any studies or other data concerning the percentage of TTY users, or potential users, suffering economic hardship from the costs of interstate toll service would be appropriate.

Research and Development

10. The question arises as to whether the Government can or should provide money for the development of new electronic message services for the deaf, for the development of inexpensive TTY compatible ter-

⁸See, for example, "Statement of the National Center for Law and the Deaf," submitted to the House Interstate and Foreign Commerce Committee, hearings on Domestic Common Carriers, September 26, 1977.

⁹We note that the New York Public Service Commission has recently considered the matter of preferential rates for deaf users of TTY terminals on the public network and has ordered its staff to work with New York Telephone Company to develop reduced charges for deaf teletypewriter users. (Order dated July 6, 1977 in Case No. 27206). In addition, the Connecticut Public Utilities Control Authority recently concluded that the chargeable time for intrastate toll applicable to TTY calls should be reduced by 75%. (Decision dated December 16, 1977 in Docket No. 70626).

minimal devices, or for further research in related areas. The economics of these services may be such that profitable private industry operation may result if Federal funds could be applied during the design or demonstration phase. Inasmuch as the principal objective of this inquiry is to provide a forum for ascertaining the telecommunication needs of the deaf and hearing-impaired, research and development needs may be addressed. Realizing that the most we can do in this regard is to serve as a repository for the comments that might be submitted, the record may still serve as a valuable source of information. For example, private and governmental entities could enter in the record of this proceeding, if they so desire, a description of their respective programs pertaining to telecommunications services for the deaf and whether or not they have funds designated for research and development in this area. Accordingly, interested parties may comment on the appropriateness of, and need for, research and development efforts and demonstration projects in this area, as well as existing funding programs currently in effect.

Items of Inquiry

11. In view of the foregoing we seek to obtain information, views and recommendations from interested members of the public in order to ascertain the telecommunication needs of the deaf and possible responses to these needs by communication common carriers and independent equipment vendors. The Commission seeks comments on any aspect relevant to a consideration of this subject matter which may not have been raised herein; and, with respect to the issues raised, we specifically request respondents to address the following:

- a. Whether there is a need for new, specialized communication services for the deaf.
- b. Whether any regulatory barriers exist which act as a constraint on the development of new and innovative services for the deaf.
- c. Whether either the incompatibility between Baudot and ASCII terminals, or the interstate MTS toll structure inhibits usage of the TTY system.
- d. Whether a need exists, and whether it would be feasible for the telephone companies to provide the following services to deaf customers using TTYs: operator, directory, and business office assistance, recorded messages, and pay TTY terminals in public locations.
- e. Whether there are any legal, contractual, or regulatory barriers to telephone companies that stand in the way of their offering TTY terminal/modem combinations that are compatible with the existing TTY system.
- f. Whether it is necessary for the benefit of hearing aid users for the Commission to establish standards, such as electromagnetic leakage, etc., in the manufacturing of telephone handsets.
- g. Whether there is a need or justification for preferential rates for the deaf, and what economic impact such rates would have, if any.

- h. Whether there are any unmet research needs in bringing new services to the deaf, and what sources of funding are available to support any additional research that may be needed.
- i. Whether federal research and development funds are needed and would the use of such funds be appropriate for demonstration projects in this area.

12. Accordingly, pursuant to Sections 4(i), 4(j), 201-205, and 403 of the Communications Act of 1934, as amended, IT IS ORDERED THAT AN INQUIRY IS HEREBY INSTITUTED.

13. Interested persons may file comments on or before May 1, 1978, and reply comments on or before June 15, 1978. All relevant and timely comments will be considered by the Commission. In reaching its determinations in this proceeding, the Commission may also take into account other relevant information before it, in addition to the specific comments invited by this Notice.

14. Pursuant to the applicable procedures set forth in Section 1.51 of the Commission's Rules and Regulations, an original and 9 copies of all statements, briefs or comments shall be furnished the Commission. All comments received in response to this Notice will be available for public inspection in the Docket Reference Room in the Commission's Offices in Washington, D.C.

15. Should individual members of the deaf community desire to participate in this proceeding, informal comments for the record may be filed over a specially installed TTY. The number of this TTY terminal will be announced in March. Meanwhile, procedural questions and general inquiries can be made over the FCC's TTY at 202-632-6999.

FEDERAL COMMUNICATIONS COMMISSION,
WILLIAM J. TRICARICO, *Secretary*.

February 8, 1978

SEPARATE STATEMENT OF COMMISSIONER ABBOTT WASHBURN

Re: Notice of Inquiry into the Needs of the Deaf and Hearing-Impaired

It was Alexander Graham Bell's keen interest in speech and the deaf, one hundred years ago, which gave us the telephone. Had he been one of the experts in electricity and magnetism of that day, according to his biographers, he would have "known" that the transmission of the human voice over wire was "impossible."

In light of this history it is ironic that today's 13 million hearing-impaired U.S. citizens enjoy so little benefit from the vast modern switched telephone network.

The present Inquiry (adopted unanimously), therefore, is most welcome and should help to speed the process of bringing modern telecommunications services to the deaf. Its timing is propitious in light of the great advances in computer communications and the work now going forward on electronic message services. We hope there will be wide response, comment, and suggestions from all interested sectors: common carriers, equipment manufacturers, Government agencies, private firms with expertise in data/hard copy communications, and representatives of the deaf community.