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REPORT BY THE

Comptroller General

OF THE UNITED STATES



LM106774

Contemplated Legislation To Provide Telecommunications For The Deaf

Contemplated legislation would provide telecommunications services to permit the deaf to communicate with all levels of government on an equal basis with hearing persons.

A pilot study should be performed prior to nationwide expansion to determine the most efficient, effective, and economical manner of implementing such a program.

The report was prepared at the request of Senator Charles H. Percy.

RELEASED



LCD-78-118
AUGUST 14, 1978



COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-146864

The Honorable Charles H. Percy
United States Senate

Dear Senator Percy:

This is in response to your letter of July 21, 1977. You requested the development of information concerning legislation being contemplated that would provide for telecommunications between deaf people and the various levels of Federal, State, and local government.

As agreed with your office, the original target date for submission of our report to you was extended to the present because of the time and effort required to develop information to respond adequately to your request. We did not take the additional time required to obtain written comments from the government or other organizations referred to in this report, as suggested by your office. However, we discussed the matters in this report with officials of the Department of Health, Education, and Welfare; the General Services Administration; the Internal Revenue Service; the American Telephone and Telegraph Company; and Western Union Telegraph Company. The report reflects additions, deletions, and changes required as a result of these discussions and includes their views where appropriate.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of the report until 2 days after the date of the report. At that time, we will send copies to interested parties and make copies available to others upon request.

We hope our report will be helpful in your consideration of the contemplated legislation.

Sincerely yours,

A handwritten signature in cursive script, reading "Thomas A. Steats".

Comptroller General
of the United States

REPORT OF THE COMPTROLLER GENERAL
OF THE UNITED STATES

CONTEMPLATED LEGISLATION TO
PROVIDE TELECOMMUNICATIONS
FOR THE DEAF

D I G E S T

This report concerns legislation being considered that would provide for telecommunications between deaf people and various agencies of Federal, State, and local governments.

An acoustic coupler developed in 1965 adapted teletype machines for use with standard telephones thereby enabling deaf persons having a coupler-equipped teletype machine (terminal) to communicate via telephone with anyone having a compatible terminal.

Between 15,000 and 20,000 terminals now are used within the deaf community. Compared to the estimated deaf population of 2,000,000, the ratio is less than 1 percent. (See ch. 1.)

Terminals used by the deaf employ what is called the Baudot Code. They are not compatible with terminals that use the American Standard Code for Information Interchange (ASCII terminals) adopted by private industry and the Federal Government as the standard code. Incompatible terminals can be made compatible through use of interface devices, but this adds complexity and cost. It is already more time consuming and expensive for deaf persons to make telephone calls than for those with normal hearing because it takes longer to use a terminal than to talk and the deaf must have a terminal. (See ch. 4.)

Contemplated legislation provides for installation of terminals in offices of Federal, State, and local governments and in other locations; establishing equitable rates for use of certain terminals; and assistance personnel at certain terminal

locations. Grants of 75 percent of the cost for installation and operation of terminals, approved by the Secretary of Health, Education, and Welfare, would be made to State and local governments. The contemplated legislation states that widespread adoption of the terminal technology would permit deaf persons to communicate with all levels of government on an equal basis. (See app. I.)

Federal, State, and local governments have a limited number of Baudot terminals, although some are restricted to use by deaf employees and most are not used to their capacity. Some were installed under Federal laws. Deaf organizations have terminals. (See ch. 2.) And some common carriers have recently installed terminals in a number of locations for deaf customer service purposes. (See p. 43.)

A variety of local and long-distance telephone services are available. Rates are broadly based on a per-call or bulk schedule and are covered by either intrastate or interstate tariffs. Bulk rates generally are less expensive for each call, assuming high use, than per-call rates for similar calls. (See p. 20.)

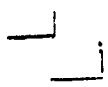
The General Services Administration's Federal Telecommunications System provides bulk rate voice and record (data and message, including teletype) services to authorized users. Although it is technically feasible to use the System to provide required communications services under the contemplated legislation, operational and administrative difficulties and costs may preclude such use--especially if incompatible terminals are employed. It would appear that use of the System, or any other communications means, would be authorized under existing Federal law at Federal, State, and local locations. To extend the System or other communications means to nongovernment parties, such as the deaf, specific legislation should be enacted. (See ch. 5.)

GAO developed an estimate of costs to carry out the contemplated legislation. The cost ranges from \$372,000 to \$748,000 in terminal purchase and other nonrecurring costs and from \$8.3 million to \$26.5 million in annual recurring costs. Additionally, the Federal Government's share for each local government terminal would be \$521 and \$10,742 in non-recurring and annual recurring costs, respectively. GAO recognized that its estimate is not precise and that other estimates could be developed. It is not possible to be precise because the number and location of terminals and traffic information cannot be accurately determined in the absence of detailed studies. (See ch. 6.)

Since a program funded or subsidized by the Federal Government should be performed in as efficient, effective, and economical manner as possible, a pilot study should be made to determine the best way to implement the program. (See ch. 9.)

The pilot study should include evaluation of the near-term and long-term effects of using either or both Baudot and ASCII terminals. It should be a coordinated effort between all levels of government to determine the information needs of the deaf and include traffic analysis (number and duration of calls and origin and destination points). The study should also develop policies, procedures, and practices for

- developing and supplying information required,
- providing publicity and assistance,
- determining the number and logical location of terminals required,
- determining the means and costs of communications required, and



--developing equitable rates for use of terminals, and billing and collection of charges (or refund, if appropriate).

A thorough pilot study should provide a sound basis for projection and expansion of the program without duplication and unnecessary costs. (See ch. 9.)

In a recent review, GAO found that a costly and orderless growth in the area of information and referral services was characterized by duplication of and competition between services and functions, waste of resources, barriers obstructing access, and inadequate services. GAO recommended the establishment of a task force to develop a national policy and plan for information and referral services. (See GAO report, "Information and Referral for People Needing Human Services-- A Complex System that Should Be Improved," HRD-77-137, Mar. 20, 1978.) That report should be fully considered prior to nationwide expansion of the contemplated legislation program. (See p. 44.)

Additional information on deaf telecommunications is currently being developed. The Federal Communications Commission is conducting an intensive inquiry into telecommunications services for the deaf and hearing-impaired. The Commission is seeking to determine the current status, the needs not currently being met, and how modern technology and other resources can be used to meet these needs. Hearings are scheduled to begin sometime after July 31, 1978. (See p. 44.)

GAO did not obtain written comments from the government or other organizations referred to in this report. However, the report reflects pertinent oral comments obtained in discussions with officials of the Department of Health, Education, and Welfare; the General Services Administration; the Internal Revenue Service; the American Telephone and Telegraph Company; and Western Union Telegraph Company.

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ABBREVIATIONS

ASCII	American Standard Code for Information Inter- change
FIC	Federal Information Center
FTS	Federal Telecommunications System
FTS(ARS)	Federal Telecommunications System (Advanced Record System)
FTS(voice)	Federal Telecommunications System (voice)
GSA	General Services Administration
HEW	Department of Health, Education, and Welfare
IRS	Internal Revenue Service
TELEX	International Teleprinter Network
WATS	wide area telephone service
TWX	teletypewriter exchange service

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CHAPTER 1
INTRODUCTION

At the request of Senator Charles H. Percy, dated July 21, 1977, we made a study concerning possible implementation of legislation being contemplated. This legislation would provide for the installation of telecommunications devices (terminals) for the deaf in agencies of Federal, State, and local governments, in offices of Members of Congress, and in other locations. (See app. I.)

BACKGROUND

Telecommunications for the deaf, using standard telephones, first began in 1965. This was made possible through the development of an acoustic coupler which could adapt teletype machines for use with standard telephones. Communication is accomplished by placing the telephone handset into the cradle of the acoustic coupler. The acoustic coupler converts the electrical pulse signals of the teletype machine into an audible tone signal for sending messages and vice versa for receiving. These couplers are either built as separate units or, as is done with more modern terminals, the coupler is built into the terminal (self-contained). Thus, a deaf person having a terminal can exchange messages in printed or visual form with any other person having a compatible terminal. According to persons familiar with deaf telecommunications, a deaf person requires more time for communicating using a terminal than a nondeaf person using a telephone for the same conversation.

LESS THAN 1 PERCENT OF THE
DEAF POPULATION OWN THEIR
OWN TELECOMMUNICATIONS TERMINALS

The number of hearing impaired persons in the United States in 1971 was estimated to be about 15 million. ^{1/} This includes an estimated deaf population of around 2 million. We were not able to obtain data on what portion, of the remaining 13 million persons, would have hearing impairment severe enough to warrant the use of terminals. The number of terminals for the deaf in use today is estimated to be between 15,000 to 20,000 which includes

^{1/}Jerome D. Schein and Marcus T. Delk, Jr., "The Deaf Population of the United States," Chap. II, p. 25, National Association of the Deaf, Silver Spring, Maryland, 1974.

about 10,000 to 2,000 that are owned by individual deaf persons. The other terminals are used by public and private organizations that serve the deaf. For example, the Internal Revenue Service (IRS) provides free service for the deaf, to its Indianapolis office terminals, for answering tax inquiries. Thus, the number of terminals now in use equals less than 1 percent of the deaf population.

DEPARTMENT OF HEALTH, EDUCATION,
AND WELFARE RESPONSIBILITIES
UNDER CONTEMPLATED LEGISLATION

The contemplated legislation would give the Department of Health, Education, and Welfare (HEW) much of the responsibility for initiating, administering, and funding the installation of telecommunications devices to permit deaf persons to communicate with all levels of government. The Secretary of HEW would be tasked with the installation of telecommunications devices for the deaf in at least five agencies of the Federal Government with whom deaf persons have the greatest need for communication. The legislation would designate HEW, IRS, and the Department of Labor as three of those agencies, with the remaining two agencies to be selected by the Secretary of HEW after consultation with the Deafness and Communicative Disorders Office of HEW, two private deaf organizations (The National Center for Law and the Deaf and The National Association of the Deaf), and other appropriate sources knowledgeable of the deaf public's problems.

Also, the Secretary of HEW would be responsible for the installation of telecommunications devices in at least 100 other locations across the Nation to include at least 1 location in each State. Further, Federal grants would be made available for the installation and operation of additional terminals by State and local government. The grants would cover 75 percent of the costs--States and local governments would be required to provide the remaining 25 percent. The location of these devices would be made with the objective of providing access to telecommunications with all levels of government for as many deaf persons as possible.

The legislation would also require that at least one employee be made available at each of the above-described locations to assist deaf persons during normal working hours.

RELATED LEGISLATION

Several legislative proposals have been either contemplated or introduced in the Congress in recent years. For example, the language of a House Bill (HR 6711) is identical to that of the contemplated legislation being addressed in this report. Several other less comprehensive bills have been proposed. Additionally, on August 5, 1977, section 113 of Public Law 95-94 authorized a 1-year trial installation of a terminal for use by Senators and members of their staffs, to receive communications from deaf persons and persons with speech impairments. Actual installation and trial operations have been delayed until fiscal year 1979 pending authorization for personnel to operate the terminal.

HEW HAS ALREADY FUNDED SOME TERMINALS FOR VOCATIONAL REHABILITATION

The "Vocational Rehabilitation Services Act of 1973," as amended, (29 U.S.C. 701) provides a broad range of services to the handicapped. Under section 723(a)(11), the scope of rehabilitation services available includes telecommunications, sensory, and other technological aids and devices. Additionally, section 762(a) and (b) authorizes Federal grants and contracts for research on equipment and devices suitable for solving problems in the rehabilitation of handicapped individuals. The House of Representatives also passed a bill (HR 12467) on May 16, 1978, which would in part amend the "Vocational Rehabilitation Services Act of 1973" to provide for the use of existing telecommunications systems (including telephone) to meet the particular needs of handicapped individuals.

The Rehabilitation Services Administration of HEW administers the vocational rehabilitation program at the Federal level. The Administration (1) provides leadership to the States in planning, developing, and coordinating their overall programs and (2) evaluates program performance. Each fiscal year, States must submit for approval a vocational rehabilitation services plan. Federal program funds for vocational rehabilitation services are apportioned among the States on the basis of population and per capita income. For most aspects of the program, the Government pays 80 percent of the costs incurred by the States in rehabilitating handicapped persons; States are required to provide the remaining share. Furthermore, HEW's Program Regulation Guide RSA-PRG-77-12, dated August 25, 1977, states:

"* * * each State Vocational Rehabilitation agency at the earliest possible time should procure for every district office a telecommunications device [for the deaf] * * *"

In Indiana at least two State agencies have used HEW funds to purchase terminals for communicating with their deaf clients. Several other States have installed terminals in their vocational rehabilitation agencies. The State of California also provides some terminals to deaf clients undergoing rehabilitation training preparator' to entering the labor market. Due to the limited scope of our review, we were not able to determine the extent of HEW funding for terminals provided by vocational rehabilitation programs at the State level.

HEW ALSO HAS AUTHORITY
FOR DEMONSTRATION PROJECTS
IN TELECOMMUNICATIONS

The "Educational Broadcasting Facilities and Telecommunications Demonstration Act of 1976" (Public Law 94-309) added section 392a to the Communications Act of 1934 (47 U.S.C. 390). This allows HEW to make grants or award contracts for the purpose of demonstrating telecommunications technologies that may be used for distributing health, education, and public or social service information.

HEW recently awarded several grants for demonstrating telecommunications techniques that may be used in informational projects for the general public and special groups. One of these grants, amounting to \$147,825, was applicable to communication with or among the deaf. Essentially, this project was to demonstrate the use of a computer to store and forward messages for the deaf via commercial telephone services.

CONTEMPLATED LEGISLATION IS SILENT
ON ROLE OF GENERAL SERVICES ADMINISTRATION

The General Services Administration (GSA) is responsible for managing the Federal Telecommunications System (FTS) and also manages the Federal Information Centers (FICs). The contemplated legislation is silent, however, concerning GSA's future role with regard to telecommunications between the Federal Government and the deaf. Its current responsibilities for the FTS and information centers are as follows.

FTS

By authority of the Federal Property and Administrative Services Act of 1949, as implemented by Federal Property Management Regulations Part 101-35 (Telecommunications), GSA manages FTS, which was established in 1963 to provide economical communications services for the Federal Government. The FTS includes a voice network, hereafter referred to as FTS(voice); and a slow speed record (message and data) network known as the Advanced Record System, hereafter referred to as FTS(ARS).

The FTS(voice) system permits calls among Government agencies located in nearly 500 cities and communities. There are more than 100 Federal agencies and departments using the FTS(voice). Authorized users may call any telephone in the system and all commercial telephones in the 50 States, Puerto Rico, the Virgin Islands, and Canada. Also, by supplying the proper information to an FTS operator, calls from commercial telephones may be placed in the contiguous 48 States for interconnection into the FTS(voice).

The FTS(ARS) currently services approximately 1,650 stations, which are located in 20 Government departments and agencies, throughout the United States. FTS(ARS) has two types of switching, circuit switching and message switching. Circuit switching is a service that provides dial-up, point-to-point connection between terminating equipment. Message switching uses computers between terminating equipment to receive, store, process, and forward record messages. GSA also uses FTS(ARS) in 29 of its Federal Telecommunications Record Centers. There are 73 centers located in over 50 major metropolitan areas to provide record and facsimile services for Government organizations in close proximity.

FICs

The FICs were created by executive direction of the President in 1965 to provide a basic Federal Government information focal point for all citizens. Most FICs include both walk-in and telephone information service. Currently, 17 Federal agencies and departments participate in the FIC program on a reimbursable basis.

Presently, 85 cities are served through 38 information centers. For the 47 cities where the centers are not physically located, toll-free telephone service is provided to an FIC. On a national average, two-thirds of the inquiries

received by FICs are via telephone; one-third are through walk-in service. At the time of our review, none of the FICs had terminals for communicating with the deaf.

SCOPE

Our major study efforts concerning the contemplated legislation were directed toward such areas as placement of terminals, including potential service in relation to the service furnished the nondeaf; technical alternatives; estimated cost impact; and user charges. Additionally, limited information was obtained about existing terminals and, to the extent noted during our study, about other related programs.

We examined relevant documents, including published telecommunications tariffs and current Federal and selected State laws, and held discussions with various knowledgeable officials.

Our information sources included

- selected Federal Government departments and agencies,
- selected State and local Government organizations,
- various public and private deaf services organizations,
and
- several telecommunications carriers and equipment manufacturers.

CHAPTER 2

EXISTING FEDERAL, STATE, AND LOCAL TERMINALS

FOR COMMUNICATING WITH THE DEAF

Federal, State, and local governments, and local community service organizations have installed terminals for the purpose of furnishing information and assistance to deaf persons. Some of these terminals are installed at locations likely to be selected under the contemplated legislation. Additionally, some of the State-installed terminals were partially funded through Federal Government vocational rehabilitation grants.

TELECOMMUNICATIONS FOR THE DEAF IN SELECTED FEDERAL GOVERNMENT DEPARTMENTS AND AGENCIES

Our study of existing Federal terminals was limited to five departments or agencies. This includes the three departments or agencies--HEW, IRS, and the Department of Labor--specified in the legislation and two agencies--Civil Service Commission and Immigration and Naturalization Service--selected by the National Center for Law and the Deaf (a private deaf organization). The Immigration and Naturalization Service did not have any terminals. The remaining four agencies, where many of the agency officials could not readily verify the existence or identify the locations of their terminals at the beginning of our review, had at least 34 terminals.

Some of these terminals are intended only for the use of deaf Federal employees, and are not available for general use. The others are intended for use by deaf Federal employees and/or to provide service to the deaf community. (See app. II.)

The employee/public service terminals are installed at various locations within the United States. Of these locations, only three are listed in the 1976-1977 International Telephone Directory of the Deaf. Most of the remaining unlisted locations had terminals installed during the latter part of 1977. We believe that such recent installation precluded publication in the telephone directory.

Callers within the United States can communicate with any of the various public service locations since each is

assigned one or more public telephone numbers. Most locations use the telephone services for both voice communications and terminals.

Although we were able to locate some Federal terminals, the number in use is small, and many have only recently been acquired. One agency that has had the most experience is IRS, which began operating terminals in one district in 1975 to test the feasibility of such operations. The following year this terminal-service was expanded to seven districts. About mid-1976, IRS considered providing the taxpayer services throughout the contiguous 48 States from either one or three terminal locations. A single location--the Indianapolis, Indiana, District Office which began toll-free service in late 1976--was selected since less equipment was necessary, coverage for the normal working day in the various time zones could be achieved through staggered working hours, and fewer telephone numbers would create less confusion for the deaf. Recognizing that the number and locations of Government terminals should depend upon the present and future demand for Government assistance to the deaf, an IRS official stated that for the foreseeable future only the existing Indianapolis site was justified.

Several Federal officials believe that their terminals provide satisfactory service to the deaf users. For example, IRS had received favorable comments by the newspaper media and in a letter from a deaf user. However, Department of Labor officials believed that they did not have sufficient operating experience to comment on user satisfaction and HEW's Rehabilitation Services Administration officials did not provide user satisfaction comments concerning their regional offices terminal operations.

The estimated usage per public service terminal for the four agencies that have terminals ranged from 35 to 2,520 minutes per month. (See app. II.) Such usage is less than the monthly terminal capacity, which would be up to a maximum of 10,000 minutes per month, assuming 21 working days per month, 8 hours per day, and 60 minutes per hour.

TELECOMMUNICATIONS FOR THE DEAF IN INDIANA

State and local government agencies and community service organizations in Indiana operate several terminals to serve the deaf. (See app. III.)

Although the terminals we found in the State and local agencies are used primarily to conduct business with the

deaf, none of these agencies share their terminals with other agencies. The terminals at three of the four State agencies are also available for personal use by their clientele. Local community service organizations provide additional services.

State and local government

There are four State agencies in Indiana that use 21 terminals to provide education, rehabilitation, and hospital services. These terminals are also available for use by deaf State employees.

The terminals at the State agencies provide several unrelated services which would normally be accomplished by telephone. The Central State Hospital uses terminals to communicate with deaf outpatients and coordinate activities with deaf organizations in the community. The Indiana School for the Deaf provides terminals to coordinate activities, perform administrative responsibilities, familiarize deaf students with using the terminal, and allow deaf students to communicate between dormitories. The school also has a terminal tied into a pay telephone so that students may make personal calls. The Indiana University uses a terminal to facilitate the management of captioned educational films. The terminals at the Vocational Rehabilitation Services are used to provide counseling, referral, and American sign language interpretive services in an effort to rehabilitate deaf clients. In those instances, where agencies permit deaf clients to use the terminal for personal calls, the deaf are charged only for long distance calls. These calls are either charged to the deaf person's home or the agency is reimbursed in cash.

There are three local governments in Indiana who use their terminals for emergencies such as police, fire, and ambulance services. Another terminal, installed in the Indianapolis Mayor's office, offers deaf persons telephone access to his office.

Terminal cost information was not readily available. State officials of two agencies said, however, that their terminals were, in part, purchased using Federal Government vocational rehabilitation grant funds. Also, the other two State agencies receive funding from HEW, but their officials did not know whether or not such funds were used in the acquisition and operation of their terminals. Local government terminals were usually donated by deaf organizations.

State and local government agencies use various telephone service arrangements. These include some separate telephone lines which are only used with deaf terminals and in other cases telephone lines are shared by the terminal and voice communications, including some which are routed through switchboards. Agency personnel identify these calls either by their familiarity with the sound of the tones generated by the deaf terminal or the silence at the other end of the line. Persons answering the phone are aware of this procedure and place the telephone handset in the coupler and begin communicating over the terminal.

The majority of terminals are used to provide the same services that the agencies normally provide to non-deaf persons by telephone. Thus, the incremental personnel costs for operating these terminals were not readily identifiable.

The State and local agencies believe the terminals improve their services to the deaf by

- eliminating the need for an American sign language interpreter,
- reducing travel requirements,
- improving understanding between the agency and the deaf public,
- saving time,
- providing quicker emergency services, and
- allowing the deaf greater access to information.

We did not find any plans for significantly increasing the number of terminals in Indiana. Also, the present utilization, where known, ranges from 6 to about 3,000 minutes per month per terminal. As previously noted this utilization would be less than maximum capacity.

Local community service organizations

We obtained information from four private/nonprofit local community service organizations. These organizations, operating several terminals, provide varying services to the deaf--answering service, American sign language interpreter service, and private/nonprofit hospital emergency calling service.

Two community service organizations installed separate telephone lines for the terminals because they have a high usage rate. The other two organizations use their telephone lines for both terminal and voice calls. Their personnel recognize terminal calls and take appropriate action in the same manner as described previously for State and local agencies.

Two of the four community service organizations allow deaf clients to use their terminals, but the deaf rarely use them. When the terminals are used, the deaf are charged only for their long-distance calls. These calls are either charged to the deaf person's home or the agency is reimbursed in cash when the bill is received.

The terminals at two organizations were purchased using State Vocational Rehabilitation Agency grants while the other two organizations used private funds. We were unable to determine whether Federal funds were involved because records were not readily available.

CHAPTER 3

PLACEMENT OF TERMINALS UNDER THE CONTEMPLATED LEGISLATION

The contemplated legislation provides general guidance concerning the placement of the Federal Government's terminals, and permits State and local governments to propose their placement of terminals. Generally, the placement of terminals, to receive inquiries from the deaf and provide responses, can be expected to vary within and between various governmental levels and their departments and agencies. Coordination among the various levels of government would be needed to assure deaf persons the greatest access to public service terminals.

CONGRESSIONAL TERMINALS

Title III of the contemplated legislation provides for the installation of a terminal at the U.S. Capitol switchboard and a terminal to any Member of Congress upon appropriate written request. With regard to the terminals for congressional members, the contemplated legislation is silent concerning the selection of locations--Washington, D.C., or a home district office. Thus, the number of terminals installed could range from the 1 terminal installed at the U.S. Capitol switchboard to 539 terminals because each Member is authorized a terminal that will be installed upon written request.

FEDERAL GOVERNMENT DEPARTMENT AND AGENCY TERMINALS

Title I, section 101, of the contemplated legislation provides that the Secretary of HEW shall have terminals installed in at least five Federal Government departments or agencies and each of their regional offices. These terminals are primarily to be used for receiving calls from deaf persons seeking information from the Government. Also, deaf persons are authorized to use these terminals in communicating with any other agencies or offices where terminals are installed under this legislation.

Generally, the placement of existing Federal terminals, as discussed in chapter 2, was accomplished without conducting any formal studies or tests. Instead, we were told that the terminal installations probably resulted from an actual or perceived requirement by individuals in specific offices. The only exception noted was IRS's public service terminals.

We asked the Department of Labor, Civil Service Commission, HEW, and Immigration and Naturalization Service information officers to provide their opinions concerning the potential placement of Government terminals for providing information or assistance to the deaf. Each officer provided a different terminal placement scenario which they believe would be responsive to the deaf, or provide service equal to or better than the service offered the nondeaf. (See app. IV.)

Many of the department and agency officials interviewed stated that a study should be performed, before placing the terminals, to determine the best locations for providing information and assistance to the deaf.

FEDERAL GOVERNMENT'S PUBLIC SERVICE TERMINALS

Title I, section 102, of the contemplated legislation specifies that the Secretary of HEW shall select at least 100 other locations for installation of a terminal for use of the deaf in communicating with the various levels of government. The guidelines for selecting these locations include:

1. Providing one location in each State.
2. Avoiding unnecessary duplication of service among the Federal Government terminals.
3. Giving priority to relatively large deaf population areas for the purposes of offering access to as many deaf persons as possible.

The contemplated legislation is silent, however, with regard to the placement of the Federal Government's public service terminals in relation to State and local government terminals.

Various methods can be used in placing the 100 public service terminals. We used two different methods of hypothetically distributing terminals to estimate the range of deaf population that would be served by each terminal. The first method distributes the 100 terminals on the basis of total population of the largest cities. The second method distributes the 100 terminals on the basis of deaf population of the States and the District of Columbia. The estimated deaf population per terminal in each State and the District of Columbia was then computed based on the estimated deaf population in each

State and the District. The following table shows the distribution methods and the ranges of high and low deaf population per terminal.

Hypothetical Distribution of Federal Government
Public Service Terminals, and Related High and Low
Ranges of Deaf Population (Two Selected Methods)

<u>Method of Distribution</u>	<u>Number of Terminals Distributed</u>	<u>Range of the Estimated Deaf Population per Terminal</u>	
		<u>Low</u>	<u>High</u>
Method 1 (based on total population of largest cities):			
One to each State's largest city and the District of Columbia	51		
One to each of the next 49 largest cities throughout the United States	<u>49</u>		
Total	<u>100</u>	2,664 (Alaska)	105,815 (Illinois)
Method 2 (based on deaf population per State):			
One to each of 19 States and the District of Columbia since their estimated deaf population is less than the average estimated deaf population per terminal (100 terminals) throughout the United States	20		
80 terminals distributed among the remaining 31 States based upon the average estimated deaf population per terminal (80 terminals) in those States	<u>80</u>		
Total	<u>100</u>	2,664 (Alaska)	27,052 (Iowa)

PLACEMENT OF STATE AND LOCAL
GOVERNMENT TERMINALS

Title II of the contemplated legislation provides that the Secretary of HEW shall make grants to State and local governments for installing terminals for the deaf in their agencies and in other locations for use by the deaf in communicating with the various levels of government. This title is silent on the selection of State and local government terminal locations. However, section 202 would have the applicants identify the government agencies and the other locations where they propose to install terminals.

We did not solicit potential terminal location scenarios from State or local government officials. However, in our opinion, tests and/or studies could provide different scenarios within and between State governments, local governments, and their agencies.

The contemplated legislation would allow State and local governments to install public service terminals in addition to the Federal Government's public service terminals that were previously discussed. In our opinion, significant coordination would be needed among the various government levels in selecting and installing public service terminals to avoid unnecessary duplication of services for the deaf and to provide terminal access to as many deaf as possible within the available funding.

NEED FOR COORDINATION AND PLANNING
REGARDING OTHER GOVERNMENT TERMINALS

The contemplated legislation is silent about using existing terminals and terminals that could be installed under other authority by the various levels of Federal, State, and local government. There would be no assurance that these other terminals would provide the same services as those proposed by the contemplated legislation. In our opinion, the placement of these additional terminals may create confusion to some deaf persons seeking information or assistance from the government because some locations may not be adequately staffed to serve the deaf. Also, these terminals could result in unnecessary duplication if, through lack of coordination, they are located or installed near each other or locations specified in the contemplated legislation.

GSA officials suggested placing terminals in FICs as an alternative to the placement of terminals as required in the contemplated legislation. They stated that FICs could serve as focal points for the deaf who seek information

< or assistance from the Government. As such, their staffs could provide information and assistance in their knowledgeable areas, and in other areas would be expected to acquire the information from the proper agency and provide the appropriate response.

FIC staffs can transfer a telephone call to another agency served by the same local switching equipment, provided it has an automated call transferring capability, and either drop from the connected parties or continue to assist in the conversation without degradation in the quality of service. Such centers would have the capability to transfer calls received from a deaf person to other agencies equipped with compatible terminals.

For walk-in service, the installation of Federal Government terminals (to be used by the deaf public) would have to be situated in areas where public access is allowed.

We believe that a test and/or studies should be performed, to determine the best locations for providing information and assistance to the deaf. This would require significant coordination among all levels of government to (1) assure adequate access and (2) avoid unnecessary duplication.

CHAPTER 4
TYPES AND COSTS OF TERMINALS
AND TRANSMISSION SERVICES FOR
COMMUNICATING WITH THE DEAF

Existing technology offers various types of terminals and transmission services for communicating via telephone with the deaf. Terminals currently being used by the deaf are incompatible with terminals which have been adopted as a standard by Government and industry. Achieving interoperability between dissimilar terminals is technically feasible but adds complexity and cost to a communications system. The continued use of incompatible terminals by the deaf could exclude them from communicating with some individuals or organizations who use standard terminals.

Adequate knowledge of many factors is needed to determine costs for communicating with the deaf community. However, such information is not available. The following sections describe some of the factors associated with providing communications between the government and the deaf, in the most economical and effective manner.

TERMINALS

Terminals operated by the deaf community use the Baudot Code. This code uses five information bits (signals) to represent capital letters in the English alphabet and numbers. The code was originally developed for teletype communications. In the Government sector, the Federal Aviation Administration and National Weather Service are still using Baudot teletype systems. In the commercial sector, the International Teleprinter Network (TELEX) is another Baudot teletype system that is still in use. Ordinarily, teletype machines are wired directly into a teletype communications system.

As discussed in chapter 1, the deaf use a combination of a Baudot teletype machine and separate acoustic coupler to communicate via standard telephones. This equipment combination appears to be the most widely used by the deaf, primarily because the communications carriers have donated their surplus teletype machines to deaf organizations. The deaf organizations recondition the teletype machines, provide acoustic couplers, and install the equipment either in deaf homes or in other locations serving the deaf.

More modern Baudot terminals, specially made for the deaf, have the acoustic coupler built in (self-contained), are electronic, and are light-weight and portable.

The costs associated with the available Baudot equipment vary somewhat. On the low end the deaf organizations either donate their reconditioned equipment or charge a nominal fee of \$200 to \$300, depending on the circumstances. Prices for similar new terminals (teletypemachine and coupler) range from \$950 to over \$1,500 depending on features provided. By comparison, the more modern and portable Baudot terminals with built-in acoustic couplers are priced from \$550 to about \$800.

Over the years, many changes have taken place in data communications to incorporate lower case letters and special symbols used in communications. A new code was developed by the United States of America Standards Institute, which is the United States standard code. The code is widely used by private industry and is called the American Standard Code for Information Interchange (ASCII). This code consists of seven information bits to represent the English alphabet letters (upper and lower case), numbers (0 - 9), and special symbols.

The U.S. Government is also committed to using terminals that conform to the ASCII code. The code has been adopted as a Federal Information Processing Standard.^{1/} Any Federal agency planning to install a telecommunications system, that would use a coding scheme other than ASCII, must first obtain a waiver for exception from the National Bureau of Standards.

The ASCII code is used in the Government for the Federal Telecommunications Service--Advanced Record System (FTS/ARS) and in the commercial sector for the Teletypewriter Exchange Service (TWX). Many of the modern ASCII terminals in use today communicate using standard telephones and acoustic couplers. Depending on the features desired, these terminals, including built-in acoustic coupler, range in price from \$680 to about \$2,000 or more.

The Baudot terminals used by the deaf are incompatible with ASCII terminals, however, because of (1) their dissimilar coding schemes, (2) the use of different tone frequencies for transmitting and receiving over the

^{1/}Federal Information Processing Standards are issued and controlled by the National Bureau of Standards, Department of Commerce.

telephone, and (3) differing speeds at which the terminals operate. These diverse operating characteristics require either (1) similar terminal equipment be used when communicating between locations or (2) an interface device 1/ be used when communicating between locations having dissimilar terminal equipment.

The technical feasibility of using dissimilar terminal equipment to communicate exists and such interface equipment can be placed at various points. At one extreme, the interface can be accomplished at one location through a centralized computer, such as used by Western Union to interface TWX (which uses ASCII) and TELEX (which uses Baudot). At the other extreme, less costly and complex devices could be used either at each Baudot or at each ASCII terminal location. Alternatively, devices which are moderately costly and complex could be located at intermediate points between those extremes.

The use of dissimilar terminals and the need for interface devices, to permit them to communicate with each other, adds complexity to any communications system. The exclusive use of either ASCII or Baudot terminals would provide compatibility between the government and the deaf. Government use of Baudot terminals, however, would not be consistent with the guidelines of the National Bureau of Standards. On the other hand, the continued use of Baudot terminals by the deaf, could exclude them from communicating with those who use ASCII.

There exists a need to evaluate the near-term and long-term effects of continuing with the Baudot type terminal or converting to ASCII for communicating with or among the deaf. This is very important due to the potential for significant growth in use of such terminals.

If it was decided to use dissimilar terminal equipment and if interface devices were to be installed at the terminals, they would be installed at either (1) each Baudot terminal or (2) each ASCII terminal. Communications officials informed us that such interface devices could be built using off-the-shelf technology at a cost of \$200 to \$500 each. Thus, the total cost of converting the 15,000 to 20,000 existing Baudot terminals used by the deaf community

1/Equipment where the conversion between operating modes, such as differing codes, frequencies, and speed, is conducted.

could range from \$3 million to \$10 million. If the number of terminals being used increases, then the associated interface costs would likewise increase.

< If the interface device(s) were to be installed at a centralized point or at intermediate points, this would require more costly and complex equipment. The number of interface points, their location, and reasonable estimates for interface equipment and associated costs cannot be ascertained because information on traffic such as volume during busy hours, call origins, and call destinations is not available. Also, we recognize that additional transmission costs could be incurred because calls between dissimilar terminals would have to be routed through these interface points.

TRANSMISSION

At the present time the telephone companies have a wide variety of transmission services available. These involve several different types of local area and long-distance telephone service.

Depending on the locality, local telephone service is either limited to a particular city or town, or metropolitan area. Local telephone service rates can be a flat monthly charge or a message unit service charge. Message unit service is the establishment of multiple calling zones within a selected geographical area (such as a metropolitan area) where the number of message units used depends upon the zone origination, zone destination, and time duration of each call (essentially time and distance factors). The monthly charge is determined by the total number of message units used and the message unit rate.

Conversely, long-distance telephone service charges depend on the type of call and various other factors, such as time of day, day of the week, distance, and time duration of the call. Long-distance services can be either intrastate or interstate and include, among others, the following:

Individual call tariffs

—Direct-distance dialed station-to-station for conversation with anyone who answers; charging begins when the telephone call is answered.

--Operator-assisted station-to-station when special assistance is required; rates are higher than direct-distance dialing; charging begins when the telephone call is answered.

--Operator-assisted person-to-person for conversation with a particular person or extension phone; rates are higher than station-to-station; charging starts when conversation begins.

Bulk call tariffs

--Wide Area Telecommunications Service (WATS) for station-to-station calls at no charge to the calling party; a service purchased from the telephone company by an organization to either reduce its telecommunications costs or to improve service to its customers; can be either inward WATS to or outward WATS from a specific location; charges are for a specified number of hours per circuit at a flat monthly charge (with overtime at specified rates); interstate and some intrastate WATS are offered by zones which generally increase the area served and tariff rate as they extend from the specific location.

--Foreign exchange service for calls between two different local calling areas; a service which connects an organization's telephone to another calling area and provides the equivalent of local service from the distant area; a 24 hour per day, 7 days a week service at a flat monthly charge per circuit regardless of call usage.

Thus, a variety of services for communicating between the various levels of government and the deaf community can be obtained. The costs associated with the available telecommunications services vary considerably because each State's public utility commission regulates the local and long-distance intrastate service rates and interstate rates are regulated by the Federal Communications Commission. These various rates are in the form of tariffs which are filed with and approved by the cognizant regulatory bodies discussed above. Some indication of the diversity of tariffs is contained in the following chapters and appendix V.

Bulk service rates are established so that customers can take advantage of the economic benefits available when their traffic volume warrants. For example, a 6-minute call during normal business hours from Washington, D.C., to

Seattle, Washington, costs \$2.46 via direct-distance dialing. On the other hand, 240-hour outward interstate WATS service from Washington, D.C., to Seattle costs \$1,675.00 per month and would permit 2,400 6-minute calls at an average cost of about 70 cents per call.^{1/} The cost for 2,400 direct-distance dialed 6-minute calls between these points would be \$5,904.00. Thus, if 681 or more 6-minute calls were contemplated, it would be more economical to use WATS.

With adequate information about traffic, including volume, peak hour use, origination points, and destination points, communications services can be provided in the most cost economical manner. However, such information is not available.

In recent years, several specialized carriers and value-added carriers have emerged to meet the demand for various telecommunications services. They may be able to provide the services required by the deaf community. We did not evaluate such services and costs, however, because they are not presently available on a nationwide basis.

^{1/}It should be noted that the outward WATS service zone permitting calls from Washington, D.C., to Seattle also permits calls from Washington, D.C., to the contiguous 48 States. Also, interstate WATS and some intrastate WATS tariffs provide two circuits and two connections. Thus, with the addition of another terminal, the theoretical capacity would be 4,800 6-minute calls for the same transmission cost.

CHAPTER 5

POSSIBLE USE OF FTS

It is technically feasible for the deaf, using their Baudot terminals, to communicate with stations on GSA's FTS. Although it is technically feasible to provide FTS service, economic, operational, and administrative factors must be considered in determining whether to use FTS or other means, such as telephone company services.

Under existing Federal law, FTS services can be provided directly or indirectly to Federal, State, and local government terminals. Specific statutory authorization on such use by other than government users is necessary. Use of FTS would involve additional problems in applying user charges (or refunding excess costs) to make costs to deaf and hearing persons equitable. (See pp. 26 to 28.)

WHY USE OF FTS CONSIDERED

Senator Percy requested that we determine whether deaf persons using Baudot terminals can communicate with stations on FTS. As noted in chapter 4, Baudot terminals are not compatible with ASCII terminals but can be made compatible through use of interface equipment. FTS, described more fully in chapter 1, uses both Baudot and ASCII terminals. Thus, use of FTS is technically feasible.

We also considered use of FTS in implementing the contemplated legislation because, if the Government were to subsidize telecommunications for the deaf, we believe the costs to the Government should be minimized. Thus, use of FTS might be an economic alternative, in lieu of establishing a separate system.

In considering the use of FTS, we assumed that terminals installed under the act, terminals owned by the deaf, the terminals required on the voice network (FTS/voice) would be Baudot. We assumed that terminals on the Advanced Record System (FTS/ARS) would remain ASCII terminals.

TECHNICAL FEASIBILITY OF USING FTS

Using the FTS(voice) or FTS(ARS) to provide communications between the deaf and Federal, State, and local government levels is technically feasible. This applies to extending FTS to the deaf community terminals as well as Federal, State, and local government terminals that would be installed under the contemplated legislation.

FTS(voice) service can be extended directly or indirectly. Direct extension would be accomplished by making the terminal user a subscriber to FTS(voice) and providing the same services as provided to present subscribers. An FTS(voice) circuit from the terminal location to the nearest FTS switchboard and a telephone instrument would be provided under this arrangement. FTS information and assistance operators would also have to have terminals.

Indirect extension of FTS(voice) would be accomplished by providing interconnection between telephone company services used by the terminals and FTS(voice). This interconnection can be accomplished by terminals using various telephone company services and placing the interconnect point at locations where FTS operators have terminals or at one or more locations where equipment can be installed to make the interconnection automatically. This arrangement would require a system for authorization and verification of terminal users and would restrict calls only to FTS users under current procedures.

It should be noted that FTS(voice) users also have local and long-distance telephone company services. Thus, terminal users could communicate with FTS(voice) users through this means, although costs of such services are generally higher than FTS(voice) services.

FTS(ARS) service--both message switched and circuit switched--can also be extended directly or indirectly. Although extending FTS(ARS) through message switching centers is technically feasible, we did not consider this further because of the operating characteristics of this service. The receive, process, store, and forward functions of this service do not provide a continuous connection and this could result in delay (at times substantial) between sending and receiving portions of a communication.

Direct extension of circuit switched network FTS(ARS) service would be accomplished by providing an FTS(ARS) circuit to the terminal from the nearest circuit switched network (district office) switch. Under this arrangement, an acoustic coupler on the terminal for the deaf would not be required. It would require, however, a device at the terminal to perform the answerback ¹/ _{function}.

¹/Answerback is a technique that automatically provides verification of predetermined codes between sending and receiving terminals.

Although FTS(ARS) terminals are ordinarily hard-wired into the network, portable terminals for the deaf could be connected by means of plug-type connectors.

Indirect extension of circuit switched network FTS(ARS) service could be accomplished by providing interconnection between telephone company services used by terminals for the deaf and the circuit switched network FTS(ARS). One or more interconnection points--such as FTS(ARS) switches--may be designated as interconnecting points. This arrangement would require that interconnect points have equipment to convert the tone signals of terminals for the deaf to pulse signals of the FTS(ARS). It would also require a system for authorization and verification of terminal users to screen-out unauthorized users, or incorporate the answerback feature at the terminal.

Under both direct or indirect extension of FTS(ARS), provision would have to be made for interface of Baudot and ASCII equipment, described previously in chapter 4. Also, classmarking ^{1/} would be provided under both arrangements.

PRACTICALITY OF USING FTS

Although, as described above, it is technically feasible to use FTS to provide communications services between the deaf and Federal, State, and local governments, it may or may not be practical. Practicality requires a consideration of economic, operating, and administrative factors including the requirement that deaf persons have equal access (from the cost standpoint) to the various government offices.

Practicality factors must be considered at each terminal location to determine (1) whether FTS (and whether direct or indirect) or (2) some other means, such as telephone company services, should be used. Consideration must be given to such matters as

--expected traffic, including number, type, and duration of calls to or from the location, and grade of service desired;

^{1/}Classmarking is a feature performed at the switch that permits terminals to communicate with only certain selected other terminals.

- location of FTS connection point and distance of extension to the terminal location;
- tariffs of the various equipment and services;
- compatibility of equipment;
- additional equipment or services required;
- existing operational procedures and controls, and changes required; and
- existing administrative procedures and controls, and changes required.

All of these matters affect costs and could affect the operational and administrative feasibility determination of whether to use FTS.

For example, it would obviously not be economically attractive to extend FTS directly to a location having only one call per month, whereas extension to a location having numerous long-distance calls might be economically beneficial. As noted in the previous section of this chapter, we did not consider use of the message switched service of FTS(ARS) because of the operational delay involved. Operational and administrative procedures, such as those required for authorization and verification of users, could also have an impact on the determination.

In addition, if a large number of new users were to be added to FTS, consideration of the impact would have to be made. Expansion or addition of switchboards, switches, or interswitch circuits might be required. Such expansion or addition could have an impact on costs to the user.

We did not compute or estimate the costs of providing FTS service to the various terminal locations. We did not know the location of such terminals and we could not estimate traffic with any degree of accuracy.

Using either FTS(voice) or FTS(ARS), a system for (1) collection of user charges or (2) refund of costs to users in excess of costs to hearing persons making similar calls would be required.

Currently, FTS traffic information is limited to (1) a statistical sample of call information on FTS(voice) and (2) accumulated time used by terminal on the FTS(ARS)

circuit switched network. Such limited information is considered adequate by GSA for present billing purposes because the FTS charges to subscribers are insensitive to duration and destination of each call. As stated earlier, a deaf person requires more time for communicating using a terminal than a nondeaf person using a telephone for the same conversation. However, this limited information is inadequate for computing charges to the deaf on an equitable basis. Call information for determining equitable charges would require additional costs for reprogramming of existing traffic recording equipment, acquisition and programming of new equipment, or manual recording.

Further discussion of user charges and refunds, contained in chapter 7, would be equally applicable if FTS were used.

EXISTING AUTHORITY FOR USING FTS

The authority for using FTS is contained in several legislative and executive directives that provide guidance on permissible uses. Congressional use is governed by the provisions of (1) Committee Orders No. 28 and No. 30, House of Representatives, Committee on House Administration, and (2) 2 U.S.C. 58 and 58a for the Senate. Executive agency use is governed by Federal Property Management Regulations--Part 101-35 (Telecommunications). Additional authority for extension of communications services to State and local units of government is provided by OMB Circular A-97 which permits Federal agencies to provide specialized or technical services (including communications) under Title III of the Intergovernmental Cooperation Act of 1968 (Public Law 90-577).

In other instances, telecommunications services provided by the Federal Government through the public telephone system are governed by the provisions of 31 U.S.C. 680a which requires the head of an agency which provides such services to certify that toll charges are necessary in the interests of the Government. Some Federal Government departments and agencies, such as HEW, IRS, and the Veterans Administration have also been granted special legislative authority that provides for free telecommunications services to the public under certain programs.

As discussed in chapter 1, FTS was established to provide telecommunications services for the Federal Government. GSA officials advised us that there is no specific legislative authority permitting them to offer the use of FTS services to nongovernment entities, including the deaf.

It would appear from the above that use of FTS, or other communications means, would be authorized under existing Federal law at Federal, State, and local government locations. To extend FTS service to parties, such as the deaf, specific legislation is necessary. Regarding the use of other communications means to enable the deaf to communicate with Government agencies, although there appears to be ample authority under 31 U.S.C. 680a, when accompanied by a certification that payment of toll charges is necessary in the interest of the Government, specific authorizing legislation would be preferred if the establishment of a Government-wide program is planned.

GSA, in noting that the contemplated legislation makes numerous references to HEW's responsibility for the telecommunications devices, expressed concern that this responsibility could conflict with GSA's general communications responsibilities under the Federal Property and Administrative Services Act of 1949.

CHAPTER 6

ESTIMATED COST TO IMPLEMENT

CONTEMPLATED LEGISLATION

The preceding chapters have discussed a wide array of factors that need to be considered in determining the cost impact of the contemplated legislation. Information on some of these factors was not available and could not be estimated with any degree of accuracy. Nevertheless, because we have been asked to do so, we have developed a scenario and estimated costs, however imprecise, to implement the contemplated legislation.

We recognize that other scenarios and cost estimates could be developed. However, we believe they would be equally imprecise because of the lack of information--particularly the number of terminals to be installed and the number and duration of calls that would be made--on factors needed to develop scenarios and cost estimates.

SCENARIO AND COST ESTIMATE

Our scenario provides for one purchased terminal at each location and permits each terminal to call any other terminal within its community of interest. Calls would generally be made using bulk tariff rates (such as Federal Telecommunications System--FTS/Voice or Wide Area Telephone Service--WATS), thus avoiding the more expensive single call tariffs (such as direct-distance dialing).

The estimated cost impact to the Federal Government, for terminals installed under the contemplated legislation, has been made for two options. One option provides one terminal at each of the five congressional office buildings and the other provides a terminal for each Member of Congress. Each of these options is priced with regard to low (measured--10 hour per month) and high (full period--240 hour per month) WATS utilization. These are as follows:

Option	Number of terminals	Nonrecurring (one-time) costs	Annual recurring (operating) costs, including	
			Measured 10-hour WATS	Full period 240-hour WATS
Federal and State locations, in- cluding five terminals for Members of Congress	601	\$372,000	\$8,300,000	\$16,600,000
Federal and State locations, in- cluding 539 terminals for Members of Congress	1,135	748,000	9,800,000	26,520,000

Additionally, the estimated Federal Government share of costs for each local government terminal would be \$521 and \$10,742 in nonrecurring and annual recurring costs, respectively. Further details of these costs are discussed below and summarized in appendix V.

TERMINALS

As discussed more thoroughly in chapter 4, Baudot and ASCII terminals are not compatible. Because equipment to make them compatible would add costs and because existing terminals for the deaf are Baudot, we assumed that Baudot terminals would be used. We have estimated that a modern portable Baudot terminal (coupler included) would cost about \$650 to buy and \$234 per year to lease.

The contemplated legislation provides for installation of a terminal in specific locations and in other locations as desired by various Government officials. (See ch. 3 and app. I.) Our scenario for terminal distribution and the basis for their selection is shown in the following table.

Terminal Distribution Table

<u>Primary User</u>	<u>Number of locations selected</u>	<u>Basis of selection</u>
Agency headquarters:		
HEW	1	Identified in contemplated legislation.
Department of Labor	1	"
IRS	1	"
Civil Service Commission	1	a/Provided for in contemplated legislation.
Immigration and Naturalization Service	1	"
Regional offices	41	Provided for in contemplated legislation.
Members of Congress (as requested)		
Option A	5	One terminal for each Senate and House office building in Washington, D.C.
Option B	539	One terminal for each Member in their Washington, D.C., office.
Central Switchboard of the Capitol	1	Identified in contemplated legislation.
Federal public access terminals	100	Contemplated legislation specifies at least one per State. Terminals distributed based on deaf population by State. (See p.14, method 2.)
Grant programs:		
State locations	449	b/Nationwide distribution based on ratio of deaf population in California to the existing State of California terminals.
Local government locations	0	None selected; no basis for distribution.

a/The contemplated legislation requires HEW, in cooperation with deaf organizations, to select two additional agencies. For the purpose of our study, the two additional agencies shown were suggested by the National Center for Law and the Deaf.

b/The number of terminals in California is used only as a base for estimating other State requirements and is not intended to indicate a precise requirement for any State, including California.

The terminal distribution and costs thereof are summarized in appendix V.

TELECOMMUNICATIONS SERVICES

Local and long-distance telephone services are necessary to communicate among the terminals provided for. Local telephone service can be provided by extension from Government-managed switchboards or by commercial business lines. Long-distance services are available through FTS and through services offered by telephone companies, including, direct-distance dialing, operator-assisted station-to-station and person-to-person calls, WATS, and other private line services. The selection of the optimum combination of telecommunications services, and planned usage of each service, requires an engineering and cost benefit study based on many factors, including traffic volume, communities of interest (origination and destination locations), desired call completion rates, and applicable intrastate and interstate tariffs.

In the absence of such information, our scenario for telecommunications services was developed to permit each terminal to call any other terminal within its community of interest. Such calls would generally be made using bulk tariff services (FTS and WATS), thereby avoiding the presumably higher individual call tariffs (such as, direct-distance dialing). The telecommunications services and the basis for their selection is shown below and summarized in appendix V.

Local service

We did not estimate any additional costs for extensions from Government switchboards on the assumption that existing extensions had sufficient capacity to handle the traffic and would provide an acceptable call completion rate. However, if separate extensions were installed by GSA, these costs could average \$30 per extension. All commercial business lines were priced at \$20 per month or \$240 per year for each line, which is our computed average cost for selected cities throughout the United States.

Long-distance services

Direct-distance dialing and operator-assisted long-distance services are automatically made available to local service subscribers. As these are nationwide services, they can provide a means for interconnecting Federal, State, and local government terminals. The costs for these services are computed for each call based on the tariffs

which vary according to the time and distance. Since demand (traffic) information is not available, we could not estimate costs for these services.

FTS(voice) long-distance services are available through Federal Government-managed switchboards that serve many civil departments and agencies. These services offer FTS users direct dialing to other FTS users and most off-net commercial numbers. Public telephones are provided access into FTS(voice) only through switchboard operators and when authorized. We assumed that Federal terminals served through extensions from Government switchboards could use FTS(voice) for outward service. ^{1/} We did not estimate any additional costs for FTS because the impact on FTS and resulting costs to the Government cannot be ascertained without knowing the number and duration of calls and origination and destination points.

We selected WATS for system cost analysis purposes because of its flexibility of service and readily determinable cost. We assumed (1) inward interstate WATS to Federal Government terminals serviced by Government switchboards and (2) inward and outward intrastate WATS for all State-operated terminals under the grant program.

The WATS costs were estimated based on the applicable tariff, terminal location, and applicable geographic area served by the primary user. These estimates are shown separately for a 10-hour monthly base period and 240-hour monthly base period as tariffed for interstate service or adjusted thereto for consistency in intrastate rates. The minimum intrastate base period for some States is greater than 10 hours or 240 hours. For estimating purposes, we used the minimum offering of these States. There would be additional costs if the selected base period is exceeded during the month; however, we did not include such costs in our estimates.

Our scenario did not provide either FTS or WATS service to the 100 federally operated public service terminals or the local government terminals. Such service is not needed by these terminals because our scenario

^{1/}Members of Congress may elect to use outward WATS as of January 1977, with additional service provided through FTS(voice). (Public Law 95-94, 2 U.S.C. 58a) (Committee Orders No. 28 and No. 30, House of Representatives, Committee on House Administration.)

provides the State government and other Federal locations with inward WATS.

The tariffs of the communications common carriers provide for a connection charge to initiate most telecommunications services. The tariff for installing each commercial business line is \$45.00. The tariffs for installing interstate and intrastate WATS lines are \$54.15 and \$45.00 each, respectively.

OTHER FACTORS

Factors considered

Space rental

If the terminals are located off existing Federal Government premises--we assumed no charge for use of space in existing Federal Government premises--the leasing of additional space will be necessary. We assumed that 120 square feet is adequate for a terminal site. To price this area, we used a nationwide average of \$7.25 per square foot per year. This average is based on space charges experienced by GSA. The annual charge of \$870 per location was applied to the 100 Federal public service sites and those sites under the grant program.

Assistance personnel

The contemplated legislation requires that at least one employee be available to assist the deaf at each terminal location. We assumed that if the terminals are placed in existing Federal facilities, present personnel resources could provide assistance.

In the event the terminal is located off the Federal Government agency premises or furnished under the grant program, ^{1/} we assume additional personnel would be required to provide assistance and operate the terminal. Officials of HEW advised us that such an employee would be classified as a GS-5. We have used a composite GS-5 rate of \$13,213

^{1/}Assistance personnel provided at grant terminals could be made available with existing employees or new-hires; however, regardless of the source of funding (see ch. 1 concerning discussion of Vocational Rehabilitation Services Act of 1973) we believe that such costs should be considered part of this program.

per annum (salary and employer contribution) as our estimated cost. We used this rate for estimating assistance personnel cost at Federal, State, and local terminal locations.

We assumed only one employee per terminal site. It is recognized that because of leave, training, and other absence, one employee may not be adequate. Conversely, a part-time employee might be adequate at some locations.

Factors not considered

In addition to the costs discussed above, other costs may be applicable under various situations. Such costs include maintenance of owned terminals, special charges relating to telecommunications services, increased administration, advertising, telephone listings, utility costs, etc. Because each of these costs is dependent on a variety of factors and because exact locations and arrangements for terminals are unknown, we have made no estimate of their impact. Also, we did not adjust the number (and costs) of terminals required which could be reduced if existing government terminals for the deaf could be used.

SCENARIO CAVEATS

In addition to the reasons discussed above and in appendix V, our scenario is not precise because information on four factors, which could not be determined, could have a significant impact. These are:

--Our scenario does not provide for local terminals. However, we did estimate that costs for a terminal, telecommunications services, assistance personnel, and space would cost the Federal Government (75-percent share) \$521 in nonrecurring costs and \$10,742 in annual recurring costs if the terminals were purchased. This could be significant because there were (at the beginning of 1972) about 78,000 local government units. Thus, if each local government unit purchased a terminal, the Federal Government's share would be over \$40 million and \$800 million in nonrecurring and annual recurring costs, respectively.

--We assumed one terminal per location, due to the absence of traffic information. It could well be that the volume of calls and the desired call completion rate would require more than one terminal per location. Thus, if two terminals were required, this would presumably double the cost for terminals,

telecommunications services, assistance personnel, and possibly space.

- User charges were not considered in our cost estimate. Depending on the user charges or rate factor decided upon and the type and number of calls it would be applied to, this cost offset could be significant. Thus, for example, if the factor was 75 percent, the Government's share of telecommunications services would be reduced by 25 percent. This cost offset would, of course, be reduced by the costs of administering the user charges program, which could be substantial.
- Our scenario does not include costs of FTS services although such services are provided in our scenario. If the volume of calls made over FTS is significant, the costs would also be significant.

CHAPTER 7
ESTABLISHMENT OF EQUITABLE RATES
AND APPLICATION OF CHARGES
FOR USE OF TERMINALS

The contemplated legislation provides for establishment of equitable charges for use of certain terminals installed under the act. It is not clear whether such charges are to be applied to use of all terminals installed under the act and whether reduced charges are to be applied to calls by deaf persons using their own terminals when calling such terminals. Application of user charges would be complicated by the fact that Federal organizations are not consistent in providing toll-free telephone services. The administrative effort and costs to obtain and maintain current information required to determine equitable user charges and to develop and apply procedures and controls required to implement user charges could be substantial.

APPLICATION OF CHARGES FOR USE
OF TERMINALS NOT CLEAR

The contemplated legislation provides that equitable rates be established and user charges be levied for the use of (1) the 100 Federal Government public service terminals and (2) state and local government terminals installed under the grant program. These charges would be limited to charges incurred by nondeaf persons seeking similar assistance from the government. HEW would be required to issue regulations prescribing rates for user charges to be levied at Federal public service terminals. State and local governments would also have to establish similar rates for user charges under the contemplated legislation.

The contemplated legislation is silent, however, on levying user charges for use of terminals installed in Federal departments and agencies, even though it specifically provides that such terminals be made available for use by the deaf. The contemplated legislation is also silent concerning use of Members of Congress terminals by the deaf and user charges for such use. Application of user charges for use of some terminals but not for others installed under the act, would be inconsistent.

Furthermore, it is not clear whether reduced rates are to be established and applied to calls by the deaf from their own terminals to terminals installed under

the act. If not, it would cost a deaf person more than a nondeaf person making a similar call because a deaf person requires more time using a terminal than a nondeaf person using a telephone.

SOME TOLL-FREE SERVICE
CURRENTLY PROVIDED

The problem of equity in applying user charges is further complicated by the fact that some toll-free telephone services are currently provided to (1) the deaf and nondeaf, (2) the nondeaf but not to the deaf, (3) the deaf but not to the nondeaf, and (4) neither the deaf nor nondeaf.

For example, some Federal organizations--such as the taxpayer services provided by IRS and the Civil Service Commission's Federal Job Information Centers--currently provide free telephone service to the nondeaf. IRS also provides free tax inquiry service to the deaf, at its Indianapolis terminals. At the time of our study, however, the Federal Job Information Centers did not provide toll-free service to the deaf because they did not have terminals for communicating with the deaf. Conversely, the Social Security Administration provides toll-free service to the deaf in the State of Georgia but does not provide toll-free service to the nondeaf in that State. Other Government organizations neither provide free telephone services to the nondeaf nor terminals for communicating with the deaf. Thus, toll-free services are provided inconsistently. This complicates the application of user charges.

ADMINISTRATION OF USER CHARGES
COULD BE SUBSTANTIAL EFFORT

The contemplated legislation provides that in establishing user charges, a factor or factors representing the relationship between the amount of time required to transmit information by means of a terminal and by means of a telephone will be determined. Further, the user charge shall not exceed the cost of the call made by means of a terminal reduced by such factor. In order to apply user charges, therefore, information on each call is needed to (1) determine cost of the call using a terminal, (2) duration of the call, and (3) the prescribed factor or factors. This could involve a substantial administrative effort.

As discussed previously in chapter 4, telephone tariffs involve a wide variety of services and applicable charges. However, such tariffs apply both to the deaf and nondeaf on the same basis--type, distance, and duration of call and applicable rates--even though a deaf person requires more time than a nondeaf person to make a similar call.

To illustrate, costs for certain interstate long-distance calls placed during the daytime on Monday through Friday between locations within the 48 contiguous states are as follows:

Cost for first 3 minutes

Distance (miles)	Direct- distance dialed	Operator Assisted		Cost for each additional minute per call
		Station to station	Person to person	
41-55	\$0.89	\$1.35	\$2.35	\$0.25
71-125	1.01	1.75	2.75	0.29
431-925	1.18	2.05	3.15	0.34
1,911-3,000	1.30	2.25	3.55	0.38

Accordingly, a nondeaf caller making a 3-minute interstate call to a location 71 to 125 miles away would be charged \$1.01. Assuming, for the purpose of illustration only, that a deaf person requires 12 minutes to make a similar call, he would be charged \$3.62--\$1.01 + (9 x \$0.29).

There are various other types of interstate services and applicable tariffs. Also, most States have similar services and their own tariffs for such services. Furthermore, these tariffs are subject to change. Thus, there are numerous services and tariffs available, some or all of which may be used, and such information must be available to determine the cost of the call made with a terminal. Individual call tariffs provide such information in the billing process. Bulk call tariffs (such as WATS), however, usually do not provide the cost of individual calls.

Concerning duration of a call, both individual call and bulk call tariffs usually do not provide this information. However, duration of a call on an individual call tariff can be computed if the tariff rates are known.

Information on costs of individual calls, where not available, and duration of all calls can be obtained through use of either telephone company operators, deaf program assistance personnel, or equipment installed to provide such information.

We are not aware of any indepth human factors research concerning the relationship between duration of similar calls made by a nondeaf person and a deaf person using a terminal. We believe that determination of a factor or factors to establish such a relationship could be accomplished with an appropriate and adequate study. Procedures for application of the factor or factors must be developed.

Administration of the user charges provision would also involve development of billing and collection procedures for use of those terminals installed under the act which are determined to be subject to user charges. Also, if deaf persons' use of their own terminals in calling terminals installed under the act is to be subject to the reduction factor, procedures for billing and collection or refund must be developed. We believe that (1) obtaining and maintaining current information, including reduction factors, required to determine equitable user charges and (2) the development and application of procedures and controls to compute, bill, and collect (or make refunds) user charges could involve a substantial administrative effort. Costs could also be substantial. Note also that the contemplated legislation does not specify the disposition of user charge collections.

CHAPTER 8
ISSUES FOR CONSIDERATION IN
PROVIDING COMMUNICATIONS FOR THE DEAF

In providing communications for the deaf, certain issues which have an impact on the effectiveness and quality of such services and recent developments relating to such services must be considered.

ADEQUATE SERVICE TO THE
DEAF REQUIRES SPECIALIZED
PUBLICITY AND TRAINING

Effective publicity of the terminal locations and services offered, and Government personnel training to be responsive to the deaf, appear necessary in establishing and maintaining a successful program for communicating between the deaf and the various levels of Government.

Need for publicity

The contemplated legislation would require the Secretary of HEW and State and local governments, to inform deaf persons of the availability of the terminals. The need for such publicity, including a proper approach, has been demonstrated by IRS.

IRS developed a publicity campaign for its Indianapolis test program in coordination with key officials in the deaf community. This campaign was targeted to deaf organizations while recognizing that a slowness of results should not be interpreted as a lack of success because even when widespread publicity reaches the deaf community, deaf persons still largely rely on endorsement from others. IRS believed that this personal approach was effective due to responsiveness from the deaf service agencies and their clientele.

IRS continued using the personal publicity approach during its nationwide implementation program. This included direct-mailing announcements containing examples of the information and services offered.

Need for training
of government personnel

Several Federal Government representatives stated that the terminal was quite simple to operate, thus little

training in its operation was necessary. However, Indiana officials believed that government personnel should have an orientation course to familiarize them with deaf communications, which may differ in grammatical structure, message abbreviations, and typing speed.

The grammatical structure of the American sign language, which is used by many deaf persons, differs in syntax. For example, the question "What time is the meeting tonight?" is "Meeting time tonight" in the sign language. Additionally, the deaf use certain abbreviations in their messages, such as GA for go ahead, QO for question, and SK for end of message. Also, some deaf persons may prefer typing at a slower speed.

Familiarization would assist the government personnel in understanding a deaf person's written message, thus being able to properly answer the inquiry. Indiana officials considered this important because the deaf community is very sensitive. They explained that a deaf person who becomes uncomfortable, embarrassed, or frustrated will be "turned-off."

IMPROVEMENT OF TELECOMMUNICATIONS SERVICES FOR THE HANDICAPPED IN CALIFORNIA

During the summer of 1977, the Pacific Telephone and Telegraph Company proposed the establishment of one or more centralized assistance center(s) for the handicapped in California. These would be accessible via publicized intrastate INWATS lines (toll free) and operational during normal working hours. Telephone inquiries would be answered for both voice and terminal callers. The center staff would be trained to counsel handicapped customers on items of communications equipment or special arrangements relative to their special needs. Pacific Telephone estimated that the annual operating cost for two of the facilities would be about \$300,000. They also recommended a cooperative effort between their company, the California State Department of Rehabilitation, and deaf consumer groups to identify terminal devices suitable for tariff offering.

On September 8, 1977, California enacted amendments to section 54.1 of its Civil Code and section 451 of its Public Utilities Code. These amendments mandate that the handicapped population of California will have full and equal access to telephone facilities.

As of July 17, 1978, Pacific Telephone provided state-wide service for the handicapped through two centralized

handicapped access centers; one located in Los Angeles and one located in Oakland. The Company has filed tariffs for terminal equipment for the deaf, and is waiting for Commission action on this item.

STATE AND LOCAL OFFICIALS SEE NEED TO
IMPROVE SERVICES TO THE DEAF

Officials in Indiana estimate that only 500 of the 50,000 deaf persons in their State own terminals. Many of these terminals are obsolete equipment donated by various companies to deaf organizations; however, there are not many of these terminals available. Volunteers from these organizations recondition and install the terminals in the deaf person's home.

In Missouri, the Director of the St. Louis Hearing and Speech Clinic estimated there were 2,500 deaf and hearing impaired in the St. Louis metropolitan area. There are some 150 terminals in the area. The deaf community provides their own emergency answering service and deaf news service. The news service provides current events information as well as specific information of interest to the deaf community. The Director stated that there was a need to locate terminals in those places familiar to the deaf community. These would include therapy centers, rehabilitation offices, social gathering points, or possibly public locations, such as the library.

California has an estimated 30,000 deaf households and only 1,800 terminals in operation throughout the State. In a 1977 study conducted for Pacific Telephone and Telegraph, the need for low-cost terminals ^{1/} for the deaf was discussed. Indiana officials also expressed a need for low-cost terminals. Another need suggested was for the deaf community to have an answering service which would enable them to get in contact with the hearing population for services and information.

AMERICAN TELEPHONE AND TELEGRAPH
POLICY IS TO PROVIDE TELECOMMUNICATIONS
SERVICES FOR THE HANDICAPPED

In December 1977 American Telephone and Telegraph issued a policy statement to its operating companies that

^{1/}IRS allows deaf persons to deduct, as medical expense, the cost of a terminal. Conversely, the cost of a telephone and any long-distance charges are not allowed as medical expenses.

service centers would be established for the handicapped. By the end of calendar year 1978, each Bell System Operating Company will have at least one service center.

...the development of terminal equipment, or the selection of commercially available equipment, to be offered deaf subscribers under tariff by the telephone companies, is being studied by American Telephone and Telegraph.

FEDERAL COMMUNICATIONS COMMISSION
IS INQUIRING INTO THE TELECOMMUNICATIONS
NEEDS OF THE DEAF

On February 8, 1978, the Federal Communications Commission initiated an inquiry in the matter of telecommunications services for the deaf and hearing-impaired. The Commission is seeking 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. They will begin hearings on this matter sometime after July 31, 1978.

OUR PRIOR REPORT RECOMMENDED A
TASK FORCE BE ESTABLISHED

In our report, "Information and Referral for People Needing Human Services--A Complex System that Should Be Improved" (HRD-77-137, Mar. 20, 1978), we concluded that the costly and orderless growth of information and referral services--relating to the vast, complex system of human services offered by Federal, State, and local Governments and by private organizations--was characterized by (1) duplication of and competition between services and functions, (2) waste of resources, (3) barriers obstructing access, and (4) inadequate services. We recommended that the Director, Office of Management and Budget, in consultation with the Secretary of HEW and the heads of other Federal agencies funding information and referral activities, establish a task force to develop a national policy and plan requiring coordination between agencies to consolidate such activities and promote the establishment of comprehensive centers, or alternatives to comprehensive centers, as circumstances warrant.

The above report should be fully considered prior to any nationwide expansion of a contemplated legislation program that would provide for telecommunications between the various levels of government and the deaf.

CHAPTER 9

CONCLUSIONS

We believe that a program funded or subsidized by the Federal Government should be performed in the most efficient, effective, and economical manner possible. Before the deaf terminal program is expanded nationwide, a pilot study should be performed to determine the best way to implement the program.

The pilot study should include evaluation of the near-term and long-term effects of using either or both Baudot and ASCII terminals. It should be a coordinated effort among all levels of government to determine the information needs of the deaf and include traffic analysis (number and duration of calls and origination and destination points). The study should also develop policies, procedures, and practices for

- developing and supplying information required,
- providing publicity and assistance,
- determining the number and logical location of terminals required,
- determining the means and costs of communications required, and
- developing equitable rates for use of terminals, and billing and collection of charges (or refund, if appropriate).

A thorough pilot study should provide a sound basis for projection and expansion of the program without duplication and unnecessary costs.

The decision of whether to use Baudot or ASCII terminals, or both, is important because of (1) the potential for significant growth in the use of terminals by the deaf community and (2) the compatibility problem and associated costs to the deaf as well as the Government.

We believe that high costs and inefficient or ineffective service could be more detrimental than beneficial, particularly in the early stages of the program. We also believe that the establishment of equitable rates to deaf users under the program would involve a substantial effort in view of the information required and the administrative

and operational procedures required. This is further complicated by the fact that toll-free telephone services are currently provided by some Federal agencies for some of their programs.

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The contemplated legislation is not clear regarding its relationship to existing statutes that would have an impact on deaf telecommunications. Also, the treatment of terminals that are currently provided by the various levels of government, or may be provided in the future, outside the provisions of the contemplated legislation, is not clear. Furthermore, as discussed previously on page 44, concerning our recent report, the costly and orderless growth in the area of information and referral services is characterized by (1) duplication of and competition between services and functions, (2) waste of resources, (3) barriers obstructing access, and (4) inadequate services. Thus, we believe that report should be fully considered prior to nationwide expansion of the contemplated legislation program.

90th CONGRESS
1st Session

S. _____

THIS BILL WAS INTRODUCED
IN THE SENATE OF THE UNITED STATES
ON _____

IN THE SENATE OF THE UNITED STATES

BY Mr. _____

introduced the following bill; which was read twice and referred to the Committee on _____

A BILL

to provide for the installation of telecommunications devices for the deaf in agencies of Federal, State, and local governments, in offices of Members of Congress, and in other locations.

(Short title of the bill)

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 "Deaf Services Act".

FINDINGS

SEC. 2. The Congress finds that--

(1) it is of critical importance to this Nation that equality of opportunity, equal access to all aspects of society, and equal rights guaranteed by the Constitution be provided to all individuals with handicaps;

(2) equal access to government is essential to in-

sure that all individuals are protected in their first amendment right to petition the government for a redress of grievances, and to insure that all individuals are able to obtain information needed by them to deal with increasingly complex government regulations;

(3) instantaneous communication with government agencies by the use of telephone is available to a large majority of citizens, but is not available to deaf persons who must resort to more expensive and time-consuming procedures to deal with government;

(4) there currently exists at a reasonable cost the technology to transmit printed information instantaneously by use of an electronic device coupled to a standard telephone, and the widespread adoption of this technology by agencies would better enable deaf persons to communicate with all levels of government on an equal basis; and

(5) it is, therefore, the policy of Congress that this technology be adopted in as many agencies and offices of Federal, State, and local governments as possible to provide deaf persons with greater access to government.

DEFINITIONS

SEC. 3. As used in this Act, the term—

(1) "agency" means any agency as defined by section 551 (1) of title 5, United States Code;

(2) "deaf persons" means any person whose hearing is totally impaired or whose hearing is so seriously impaired as to prevent the person from understanding telephonic communications when spoken in a normal conversational tone;

(3) "Member of Congress" means any Member of the Senate or House of Representatives, Delegate to the House of Representatives, or the Resident Commissioner from Puerto Rico;

(4) "Secretary" means the Secretary of the Department of Health, Education, and Welfare;

(5) "telecommunications device for the deaf" or "telecommunications device" means any equipment which would permit two-way communication of textual messages in alphanumeric form by telephone lines.

TITLE I - INSTALLATION OF TELECOMMUNICATIONS DEVICES IN FEDERAL AGENCIES AND IN OTHER LOCATIONS

Sec. 101. (a) The Secretary shall select at least five agencies of the Federal Government with which deaf persons have the greatest need for communication, including, but not limited to, the Department of Health, Education, and Welfare, the Department of Labor, and the Internal Revenue Service, and shall have installed in each such agency and its regional offices a telecommunications device for the deaf.

Such telecommunications devices shall be used primarily to receive calls from deaf persons seeking information from such agencies, but shall also be available for the use of deaf persons in communicating with any of the other agencies and offices in which telecommunications devices are installed under this Act.

(b) The selection of agencies under this section shall be made by the Secretary after consultation with the Deafness and Communicative Disorders Office of the Department of Health, Education, and Welfare; the National Center for Law and the Deaf; the National Association of the Deaf; and other appropriate organizations and individuals with special knowledge of the problems of deaf persons.

SEC. 102. (a) The Secretary shall select not less than one hundred locations, other than those selected under section 101, and shall install in each a telecommunications device for the deaf which shall be available to deaf people for their use in communicating with the agencies selected under section 101, with State agencies selected under title II, and with Members of Congress who choose to install such a telecommunications device under title III.

(b) The selection of locations under this section shall be made with the objective of providing access to telecommunications devices to as many deaf persons as possible. In

accordance with this objective, the Secretary shall identify and give priority to areas where relatively large numbers of deaf persons reside, and shall avoid selecting locations so close to each other or to an agency selected under section 101 as to cause an unnecessary duplication of service. The Secretary shall select at least one location in each State.

(c) The Secretary shall issue regulations prescribing the rates to be charged to users of the telecommunications devices installed under this section, which rates shall limit the cost to such users to the cost that would have been incurred had such users been nondraft persons seeking the same assistance by use of a telephone. In establishing such rates the Secretary shall determine a factor, or factors, representing the relationship between the amount of time required to transmit information by means of a telecommunications device and by means of a telephone. The rate to be charged a user in a particular case under such regulations shall not exceed the rate of the telephone call made by such user with the telecommunications device, reduced by such factor.

Sec. 103. (a) The Secretary shall make the selections of agencies and locations required by this title, and shall begin installation of the telecommunications devices for the deaf not later than one year after the date of enactment of this Act.

(b) The Secretary shall complete the installation of the telecommunications devices required by this Act not later than two years after the date of enactment of this Act.

Sec. 104. (a) The Secretary shall make all reasonable efforts to inform deaf persons of the availability of the telecommunications devices installed under this Act. The Secretary shall disseminate information as widely as possible to local organizations and associations of the deaf which shall—

(1) state the purpose of such telecommunications devices;

(2) state the cost of such telecommunications devices to the user; and

(3) list all the agencies, offices of Members of Congress, and other locations in which such telecommunications devices have been installed under this Act.

(b) (1) The Secretary shall issue easily understandable instructions for the use of telecommunications devices for the deaf to each agency, office, or location in which they are installed under this title.

(2) The Secretary shall require by regulation that at least one employee at each location at which telecommunications devices are installed under section 102 be able and available to assist deaf persons in the use of such devices during normal working hours.

Sec. 105. Each agency, office, or location in which a

telecommunications device is installed under this title shall keep such records as may be required by the Secretary by regulation for purposes of the report prepared under section 401 of this Act.

Sec. 106. There are authorized to be appropriated such sums as may be necessary to carry out the provisions of this title.

TITLE II—GRANTS TO STATES

Sec. 201. The Secretary shall make a grant to any State or local government meeting the requirements of this title for the purpose of installing telecommunications devices for the deaf in its agencies and in other locations for the use of deaf persons in communicating with all levels of government.

Sec. 202. (a) Any State or local government seeking a grant under this title shall make an application to the Secretary, in accordance with such terms and conditions as the Secretary may prescribe.

(b) Such application shall state the agencies of government and the other locations in which the State or local government proposes to install the telecommunications devices for the deaf.

(c) Such application shall make assurances that such State or local government —

(1) will provide 25 per centum of the funds required to install and operate such telecommunications devices;

(2) will install only telecommunications devices meeting quality standards set by the Secretary and prescribed by regulation;

(3) will make all reasonable efforts to inform deaf persons of the availability of such telecommunications devices including the dissemination of information which states the purpose of such telecommunications devices and the cost to the user, and lists all the agencies and locations in which such telecommunications devices are to be installed;

(4) will provide that at least one employee at each agency and location at which such telecommunications devices are installed is able and available to assist deaf persons in the use of such devices during normal working hours;

(5) will adopt a rate schedule for the use of such telecommunications devices which is consistent with the rates established by the Secretary under section 102 (c) of this Act; and

(6) will keep any records required by the Secretary for purposes of the report under section 401 of this Act.

SEC. 203. Upon approval of the application under section 202, the Secretary shall make a grant of 75 per centum

of the cost of installing and operating the telecommunications devices for the deaf for the first year of operation.

Sec. 204. Continuing grants for the operation of the telecommunications devices installed under this title shall be made each year, based upon a renewal application filed by the State or local government, in accordance with such terms and conditions as the Secretary may prescribe, which proves to the satisfaction of the Secretary that the assurances required by section 202 have been met and will continue to be met in the year for which the continuing grant is sought.

Sec. 205. The Secretary shall seek the cooperation of the Administrator of General Services in having transferred to States any telecommunications devices for the deaf categorized as Federal surplus property, under section 203 (j) of the Federal Property and Administrative Services Act of 1949 (40 U.S.C. 484 (j)). Such surplus shall be transferred, to the extent available, to States that have made application for such telecommunications devices under section 202, and shall be distributed among those States in an equitable manner.

Sec. 206. (a) There are authorized to be appropriated such sums as may be necessary to carry out the provisions of this title.

(b) If sums appropriated in any fiscal year are not

sufficient to carry out the provisions of this title, the Secretary shall ratably reduce the grants made to all State and local governments whose applications are approved. If additional funds are made available for such year they shall be used to ratably increase the amount paid to each such government.

TITLE III—INSTALLATION OF TELECOMMUNICATIONS DEVICES IN OFFICES OF MEMBERS OF CONGRESS AND IN THE CAPITOL

SEC. 301. Any Member of Congress shall be provided with a telecommunications device for the deaf upon a written request to the Committee on House Administration of the House of Representatives or the Committee on Rules and Administration of the Senate.

SEC. 302. The Architect of the Capitol shall install at the central switchboard in the United States Capitol a telecommunications device for the deaf, and there shall be at least one employee trained in the use of such device available during normal working hours to provide assistance to deaf persons.

SEC. 303. There are authorized to be appropriated such sums as may be necessary to carry out the provisions of this title.

TITLE IV--REPORT TO CONGRESS

Sec. 101. The Secretary shall prepare a report for Congress, not later than two years after the installation of the first telecommunications device under this Act, which shall--

(1) present the statistics kept at each agency, office, and location on the use of the telecommunications devices;

(2) analyze the efficiency of the programs to install telecommunications devices under titles II and III in light of such statistics;

(3) make recommendations on the continuation and expansion of such programs; and

(4) assess any new developments in the technology of telecommunications devices for the deaf, and means of adopting such developments in existing and future telecommunications devices for which funding is provided by the Congress.

FEDERAL DEPARTMENTS AND AGENCIES PUBLIC SERVICE DEAF TERMINALS

Department or Agency	Terminal Location	Phone Number(s)	Terminals		Estimated Date of Acquisition	Month		Total Utilization per month, minutes	
			Number of	Type		Messages per Month	Average length in minutes		
Civil Service Commission	Federal Job Information Center	Washington, D.C.	644-4118	1	Portable	3/75	42 to 168	15	630 to 2520
Department of Labor	Office of Federal Contract Compliance Programs	Washington, D.C.	503-9511	1	Fixed	10/77	b/		b/
Department of Health, Education and Welfare	Office of Education	Washington, D.C.	472-1250 g	2	Fixed	6/69	401	10	410
Rehabilitation Services Administration	Director Deafness and Communicative Services	Washington, D.C.	245-0591 245-0574	2	Fixed	11/77	84 to 210	10	840 to 2100
Regional offices:									
	Philadelphia, Pa.		596-1327	1	Portable	12/77	b/	b/	b/
	Chicago, Ill.		353-6363	1	Fixed	7/75	b/	b/	b/
	Dallas, Tx.		749-2445	1	Portable	9/77	b/	b/	b/
	Kansas City, Mo.		248-2491	1	Portable	9/77	b/	b/	b/
	Denver, Co.		372-2135	1	Fixed	7/77	b/	b/	b/
	San Francisco, Ca.		446-7133	1	Fixed	6/77	137	5	1370
Social Security Administration	Teleservice Center	Atlanta, Ga.	800-762-4578	1	Fixed	10/77	84	1	1008
		Chattanooga, Tn.	891-6625 724-4172	1	Portable	2/	42	10	420
Department of Treasury	Internal Revenue Service	Internal Revenue Service	800-829-4274	1	Fixed	11/75	91 to 111	1	910 to 1110
	Internal Revenue Service	Internal Revenue Service	800-829-4274 g	1	Portable	11/77			

a/ Estimate not available for months 10, 11, 12, 1975

b/ Estimate not available for months 10, 11, 12, 1975

APPENDIX III

APPENDIX III

STATE AND LOCAL TERMINALS
WITHIN INDIANA

Organization	Terminals		Month		Total utilization per month in minutes	Estimated terminals in service area
	No. of	Type	Messages per month	Average length in minutes		
State agencies:						
Central State Hospital Indianapolis, IN	2	Fixed	300	20	6000	550
Indianapolis School for the Deaf Indianapolis, IN	11	Fixed	a/	a/	a/	a/
Indiana University Bloomington, IN	1	Portable	4	30	120	a/
Indiana Vocational Rehabilitation Service:						
Indianapolis, IN Program Dir.	1	Fixed	a/	a/	a/	550
Indianapolis, IN Counselors	1	Fixed	10	10	100	100
Bloomington, IN	1	Fixed	5	a/	a/	1
Evansville, IN	1	Fixed	8	a/	a/	15
Ft. Wayne, IN	1	Fixed	100	10	1000	50
Hammond, IN	1	Fixed	10	10	100	15
Muncie, IN	1	Fixed	1	10	10	1
Local Agencies:						
Allen County Sheriff's Department Ft. Wayne, IN	1	Fixed	10	1	10	10
Anderson City Fire Department Anderson, IN	1	Fixed	6	1	6	1
Indianapolis Mayor's Office Indianapolis, IN	1	Fixed	1/3	a/	a/	100
Indianapolis Police Department Indianapolis, IN	1	Fixed	90	a/	a/	100
Jefferson County Central Alarm Company Carmel, IN	1	b/Fixed	a/	a/	a/	a/
a/ Unknown						
b/ To be installed.						

STATE AND LOCAL TERMINALS
WITHIN INDIANA (Continued)

Organization	Terminals		Month		Total utilization per month in minutes	Estimated terminals in service area
	No. of	Type	Messages per month	Average length in minutes		
Private/Nonprofit Community Service Organizations:						
Crossroads Rehabilitation Center Indianapolis, IN	1	Portable				
	1	Fixed	120	10	1200	100
Deaf Social Service Agency For the TPI-State Evanville, IN						
	2	Fixed	112	15	1680	11
Indianapolis Community Services for the Deaf Indianapolis, IN	1	Fixed	180	15	2700	100
	1	Portable				
Mental Health Association of Indiana Indianapolis, IN						
	1	Fixed	20	10	200	100

FEDERAL GOVERNMENT, INFORMATION, IN FORMAL MANNER,
 AND INFORMATION, PUBLIC, INCLUDING, INFORMATION,
 INCLUDING, INFORMATION, IN FORMAL MANNER,
 AND INFORMATION, PUBLIC, INCLUDING, INFORMATION,

Department	Public Responsibilities	Distribution	Costs	Potential Terminal Distribution	Anticipated Quality of Service
Public Health Service	Provide information concerning Federal employment opportunities	one for state	no	Each state presently provides statewide toll-free telephone services to the general public	Service that would be available to the needs of deaf persons seeking employment
Department of Health, Education and Welfare	Many individual Federal programs	one national center serves by toll-free telephone service	1	Provides a coordinated approach within FHW, whereby an individual would serve as a personal liaison for the deaf--obtain information from the appropriate FHW activity and referred to the deaf	Although an immediate response would not be furnished, the Service would be equal to, or better than that offered the nondisabled
Department of Labor	Many Federal programs	one at the national information office	19	Since toll-free telephone services are not normally provided, the distribution would lessen the cost to the inquiring deaf individual	The Service rendered would be equal to services available to the nondisabled
Investigation and Administration Service	Provide information concerning immigration, admission, exclusion, deportation and naturalization of aliens	one at each of the 13 districts	13	Since toll-free telephone services are not normally provided, the distribution would lessen the cost to the inquiring deaf individual	The Service provided would be equal to services available to the nondisabled

SUMMARY OF THE
ESTIMATED COSTS TO THE FEDERAL GOVERNMENT
UNDER THE CONTEMPLATED LEGISLATION

Terminal Locations	Number of Terminals	Nonrecurring (One-time) Costs	Annual Recurring (Operating) Costs, Including	
			Measured 10-hour WATS	Full Period 240-hour WATS
Federal Department and Agency				
Headquarters	5	\$ 3,500	\$ 33,000	\$ 232,700
regional offices	41	10,700	231,300	1,482,900
Members of Congress				
Option A - Five office buildings	5	3,500	33,000	232,700
Option B - each member	539	379,700	1,491,400	9,368,100
U.S. Capitol Switchboard	1	700	4,000	40,000
Federal Public Service Locations	100	49,500	1,432,300	1,412,300
Grants to states (Federal share)	449	264,000	6,643,800	13,452,000
Grants to local governments	0	a/	a/	a/
Totals				
Using Option A for Members of Congress (minimum)	<u>601</u>	<u>\$371,900</u>	<u>\$8,358,000</u>	<u>\$16,646,000</u>
Using Option B for Members of Congress (maximum)	<u>1,135</u>	<u>\$747,700</u>	<u>\$9,826,400</u>	<u>\$26,514,700</u>

a/Although estimated costs are not applicable because a distribution of local government terminals was not made, we estimated that for each local government terminal the Federal share of nonrecurring and annual operating costs would be \$521 and \$19,742, respectively.

Federal Department and Agency HeadquartersCost Estimate - Five Locations

Description	Unit Cost	Nonrecurring (One-time) Costs	Annual Recurring (Operating) Costs, Including	
			Measured 10-hour WATS	Full-Period 240-hour WATS
Terminals -				
purchased ^{1/}	\$ 650	\$3,250		
Telecommunications services				
Inward Interstate Band				
5 WATS ^{2/}				
10-hour	4,596		\$21,780	
240-hour	40,536			\$232,680
Correction charge				
Interstate WATS	\$4.15	<u>271</u>		
Total		<u>\$3,521</u>	<u>\$22,180</u>	<u>\$232,680</u>

^{1/}As an alternative each terminal may be leased at \$19.50 per month or \$234 per year. The annual leasing cost for 5 terminals would be \$1,170.

^{2/}Band 6 provides inward WATS from the 50 states.

Federal Department and Agency Regional OfficesCost Estimate - Forty-one Locations

Description	Unit Cost	Nonrecurring (One-time) Costs	Annual Recurring (Operating) Costs, Including	
			Measured 10-Hour WATS	Full-Period 240-Hour WATS
Terminals purchased a/	\$ 650	\$26,650		
Telecommunications Services				
Inward WATS b/				
Intrastate				
10-Hour various range	1,461-4,008		\$112,068	
240-Hour various range	6,600-40,110			\$ 635,760
Interstate - various band				
10-Hour various range	2,352-4,212		119,280	
240-Hour various range	10,800-41,688			847,116
Connection charge				
Intrastate WATS	45.00	1,845		
Interstate WATS	54.15	<u>2,220</u>		
Total		<u>\$10,715</u>	<u>\$231,348</u>	<u>\$1,482,876</u>

a/As an alternative each terminal may be leased at \$19.50 per month or \$234 per year. The annual lease costs for 41 terminals would be \$9,594.

b/We selected the WATS service areas necessary to serve each regional office's geographical area, based on the city location of the regional office.

Members of CongressCost Estimate - Two Options

<u>Description</u>	<u>Unit Cost</u>	<u>Nonrecurring (One-time) Costs</u>	<u>Annual Recurring (Operating) Costs, Including Measured Full-Period</u>	
			<u>10-Hour WATS</u>	<u>240-Hour WATS</u>
<u>Option A -</u>				
Five office buildings:				
Terminals - purchased a/	\$ 650	\$3,250		
Telecommunications services				
Inward Interstate Band 6 WATS b/				
10-hour	4,596		\$22,980	
240-hour	46,536			\$232,680
Connection charge Interstate WATS	54.15	371		
Total Option A		<u>\$3,521</u>	<u>\$22,980</u>	<u>\$232,680</u>

a/As an alternative, each terminal may be leased at \$19.00 per month or \$228 per year. The annual lease cost for 5 terminals would be \$1,170.

b/Band 6 provides Inward WATS from the 50 states.

Members of Congress (Continued)

<u>Description</u>	<u>Unit Cost</u>	<u>Nonrecurring (One-time) Costs</u>	<u>Annual Recurring (Operating) Costs, Including</u>	
			<u>Measured 10-hour WATS</u>	<u>Full-Period 240-hour WATS</u>
Option B - each - total - 539 locations:				
<u>Terminals -</u>				
purchased a/	\$ 650	\$350,350		
<u>Telecommunications services</u>				
<u>Inward Interstate WATS b/</u>				
<u>Band 1</u>	<u>Quantity</u>			
10-hour	75	2,352	\$ 176,400	
240-hour		10,800		\$ 810,000
<u>Band 2</u>	<u>Quantity</u>			
10-hour	21	2,628	55,188	
240-hour		15,780		331,380
<u>Band 3</u>	<u>Quantity</u>			
10-hour	194	2,760	535,440	
240-hour		18,840		3,654,360
<u>Band 4</u>	<u>Quantity</u>			
10-hour	105	2,868	391,140	
240-hour		19,740		2,072,700
<u>Band 5</u>	<u>Quantity</u>			
10-hour	133	2,940	391,020	
240-hour		20,100		2,673,300
<u>Band 6</u>	<u>Quantity</u>			
10-hour	7	4,596	32,172	
240-hour		46,536		365,752
<u>Connection charge b/</u>				
<u>Inward Interstate</u>	54.15	29,970		
Total Option B		<u>\$ 379,320</u>	<u>\$1,491,360</u>	<u>\$9,868,092</u>

a/As an alternative, each terminal may be leased at \$19.50 per month or \$234 per year. The annual lease costs for 539 terminals would be \$126,126.

b/We selected the WATS services to be commensurate with the geographic area served by the individual Members of Congress. WATS service is not available to Puerto Rico, Virgin Islands, and Guam, nor within the District of Columbia. Therefore, only the costs of terminals for the Members from these jurisdictions are included in our estimate.

United States Capitol SwitchboardCost Estimate - One Location

<u>Description</u>	<u>Unit Cost</u>	<u>Nonrecurring (One-time) Costs</u>	<u>Annual Recurring (Operating) Costs, Including</u>	
			<u>Measured 10-hour WATS</u>	<u>Full-Period 240-hour WATS</u>
Terminal -				
purchased a/	\$ 650	\$650		
Telecommunications Services				
Inward Interstate				
Band b 5/				
10-hour	4,596		\$4,596	
240-hour	40,536			\$40,536
Connection charge				
Interstate WATS	64.15	64		
Total		<u>\$704</u>	<u>\$4,596</u>	<u>\$46,536</u>

a/As an alternative, the terminal may be leased at \$19.50 per month or \$234 per year.

b/Band b provides Inward WATS from the 50 states.

Federal Public Service LocationsCost Estimate - 100 Locations

<u>Description</u>	<u>Unit Cost</u>	<u>Nonrecurring (One-time) Costs</u>	<u>Annual Recurring (Operating) Costs</u>
Terminals - purchased at	100	\$65,000	
Telecommunications Services -			
Local telephone service			
business lines	240		\$ 24,000
Connection charge			
business lines	45	4,500	
Terminal assistance			
personnel	13,213		1,321,300
Space rental	870		87,000
Total		<u>\$69,500</u>	<u>\$1,412,300</u>

As an alternative, a terminal may be leased for \$234 per year. The annual leasing costs for 100 terminals would be \$23,400.

Grants to StatesDistribution of Terminal Locations

Based on known terminals operated by the State of California we have developed the ratio of California terminals to the deaf population of the State and extrapolated this ratio to each of the other 49 States based on their deaf population. The total being an estimated 449 terminals in 50 states.

Federal Share of Estimated
Costs - 449 Locations

Description	Unit Cost	Federal Share (75%)		
		Nonrecurring (One-time) Costs	Annual Recurring (Operating) Costs, Including	
			Measured 10-hour WATS	Full-Period 240-hour WATS
Terminals - purchased a/	\$ 650	\$218,888		
Telecommunications Services				
Local Telephone Service				
Business lines	240		\$ 80,820	\$ 80,820
Long Distance Telephone	Various			
Intrastate WATS b/ (Inward and Outward)	depending on location		1,820,562	8,628,936
Connection charge				
Business lines	45	15,154		
Intrastate WATS b/				
Inward	45	14,985		
Outward	45	14,985		
Terminal Assistance				
Personnel	13,213		4,449,478	4,449,478
Space Rental	870		292,973	292,973
Total		<u>\$264,012</u>	<u>\$6,643,833</u>	<u>\$13,452,207</u>

a/As an alternative a terminal may be leased for \$19.50 a month or \$234 per year. The Federal share of leasing cost - would be (\$234 x 449 x 75%) \$78,799.

b/Intrastate WATS was computed for 444 terminals instead of 449 because five (1 - Alaska, 2 - Rhode Island and 2 - District of Columbia) were located in jurisdictions that do not have such service. Deaf persons located outside the respective local telephone service areas would incur long distance charges when placing calls to these five terminals.

Grants to Local GovernmentsAbsence of Terminal Distribution

No distribution was made because we have no idea of how many local government jurisdictions (county, township, city, borough, etc.) would participate in the program or the average number of terminals each jurisdiction would require. Also, in our opinion, the 70 local government listings throughout the United States identified in the International Telephone Directory for the Deaf would not be an adequate basis to project any reasonable universe. However, to prove the reader some indication of the potential impact, based on our assumptions, we estimated the Federal share of costs per local government terminal.

Federal Share of Estimated Costs per Terminal

	Unit Cost	Federal Share (75%) Per Terminal	
		Nonrecurring (One-time) Costs	Annual Recurring (Operating) Costs
Terminals - purchased <u>a/</u>	\$ 650	\$487	
Telecommunications Services			
Local Telephone Service			
Business Lines	240		\$180
Connection charge			
Business lines	45	34	
Terminal Assistance Personnel	13,213		9,310
Space Rental	870		652
Total		<u>\$521</u>	<u>\$10,742</u>

a/As an alternative a terminal may be leased for \$19.50 per month or \$234 per year. The Federal share of the annual lease for each terminal would be \$175.50.

(941.42)