

First National Conference

of

Agents

of

**Teletypewriters for
the Deaf, Inc.**

November 13-14, 1971

**Gallaudet College
Washington, D.C.**

Proceedings of the
FIRST NATIONAL CONFERENCE
of agents of
TELETYPEWRITERS FOR THE DEAF, INC.

Gallaudet College
Washington, D.C.

November 13-14, 1971

Published by

TELETYPEWRITERS FOR THE DEAF, INC.
P.O. Box 622
Indianapolis, Indiana 46206

This conference and the publication of the Proceedings were supported by a contract from the Office of Public Service Programs, Gallaudet College.

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FIRST NATIONAL CONFERENCE
OF AGENTS OF
TELETYPEWRITERS FOR THE DEAF, INCORPORATED

Gallaudet College
Washington, D. C.
November 13 - 14, 1971

A meeting was held at Gallaudet College in Washington, D. C. on November 13-14, 1971, involving 17 agents of Teletypewriters for the Deaf, Inc. (TDI). This National Agents Conference, at the urging of several agents, had been organized by the TDI President, Dr. H. Latham Breunig, in cooperation with Mr. Albert T. Pimentel, Director of Public Service Programs at Gallaudet College, whose office provided a contract enabling TDI to defray the expenses of assembling invited agents from all over the United States.

The meeting was opened at approximately 8:45 o'clock in the morning on Saturday, November 13, by President Breunig who appointed Joseph S. Slotnick as conference secretary.

Dr. Breunig introduced the participants and visitors. Greetings were delivered from Mr. Jess Smith of Indianapolis, TDI Vice President, who was unable to be present. Mr. Pimentel welcomed the participants and made several announcements.

Announcement was then made that the latest edition of the TDI National Directory--the so-called "Blue Book"--was in publication and would be out shortly for all members in good standing in the organization. In the Blue Book is a capsule overview of the development of the national telephone-teletypewriter network as we know it. Dr. Breunig felt that this overview in the Blue Book described our beginnings sufficiently for him to waive going into that detail.

The organization of the TDI was briefly touched upon. It consisted of a "Board of Directors" of three persons: Dr. Breunig as the Chairman; his wife Nancy T. Breunig as the Secretary-Treasurer; and the aforementioned Mr. Jess Smith as Vice Chairman. These three members of the Board all reside in Indianapolis, which makes meetings there quite easy to arrange. However, now that membership in

TDI numbers in the 1500's and is growing daily, a re-organization of TDI is probably a necessity in the near future.

An overview of operations within TDI was given by Breunig with the aid of a diagram (Appendix A) showing the generalized flow of work within the organization. Inputs to this flow consist mostly of notices sent in by agents whenever donated machines were installed by them. These notices are of myriad sizes, shapes, and composition, which fact was illustrated by slides. Breunig urged the agents to standardize on 8½ x 5½ inch sheets containing not more than two listings per page, or not more than four entries on a 8½ x 11 inch page. The desirability of standard forms being provided by TDI was brought out by several agents present.

Breunig suggested that a brochure about TDI would help tremendously in disseminating information about the organization, and said that this project should have high priority in the future program of TDI.

Other items of general interest were:

1. Many people have teleprinters obtained from private sources and TDI doesn't always have the opportunity to offer these people memberships in TDI.

2. It is hoped that eventually there will be "yellow pages" in the TDI directory for advertising purposes and as a revenue producer for TDI.

3. A \$10,000 grant from the Lilly Endowment, Inc. of Indianapolis was made to TDI for its operations. Financially TDI has had an operating loss over its first 3 years.

Mr. Paul Taylor from St. Louis indicated that he feels strongly that we should have the TDI brochure. He also mentioned that he feels that agent qualification for work in TDI should be developed. Each TDI agent was asked to give a five minute report on the beginning development of services in his area and the problems encountered in acquiring and distributing teletypewriter machines in his area. Problems discussed included the supply of teletypewriters, storage, cost of machines, methods of payment, and maintenance. Taylor described the network he and his group have developed in St. Louis. There are presently some 100 or so TTY "owners", a news messenger ("Hot Line"), weather reports via TTY, and an answering service as well as a

group of TTY mechanics available for repair work on the TTYs when needed.

Mr. Tom Rule, from Winchester, Massachusetts, next described the setup in the Boston and New England area. There now exists a Massachusetts Deaf Messenger, headquartered in the Boston metropolitan area, and a Connecticut Deaf Messenger in the Hartford, Connecticut area. New England Communication Service for the Deaf, Inc., was established in 1970 and incorporated to provide services for the people of New England within the framework of TDI.

Dr. James C. Marsters, from Pasadena, California and Chairman of the West Coast general area for TDI operations, gave a brief rundown on operations in the Los Angeles metropolitan area, as did Mr. Harold Roach of Mexico, New York, for the Syracuse/Rochester, New York area. Next was Mr. Ben Hermelin of Cleveland, Ohio, for that city and its vicinity.

More briefings were given by the following men for their respective areas:

Michael Moore for Dallas, Texas - where they use available model 14 strip-printers on loan until page printers become available and are distributed on a first-come basis in exchange for the originally loaned strip-printers.

George Ruby for Wichita, Kansas - where he reported TTYs as being generally very hard to come by.

Arthur Nelson for Omaha, Nebraska - (sporting a "Nebraska is No. 1!" button).

William Ragland for Kansas City, Missouri.

Gordon Allen for the Minneapolis/St. Paul, Minnesota area.

Robert Lankenau (President of the National Association of the Deaf) for Akron, Ohio area.

Henry "Bud" Dorsey for the Washington, D. C. metropolitan area.

Lee Brody for the New York/New Jersey PTTY for the Deaf in the New York City general area - this area has seen phenomenal growth. Brody is the sole TDI agent and is Chairman of the committee of 18 which was organized to procure, service, and maintain donated teleprinters.

Andrew Saks for the San Francisco and general Bay area in California - there was initially a big surplus of donated

teleprinters, many of which were "farmed out" to other localities needing them. The situation recently, however, was that machines were scarcer and the demand for them greater. It seemed that the fact that Western Union had purchased the TWX system from the American Telephone and Telegraph Company had created a "freeze" on available surplus printers from the Bell System telephone companies.

Next to be discussed was the availability of surplus teletypewriters. Lankenau had mentioned this during his report on the situation in the Akron, Ohio area. Machines can be obtained from government surplus agencies, often via a bidding process. Interest was expressed on getting information about procedures on such biddings. Rule and others indicated a method of getting I. D. cards allowing them to obtain listings of surplus government equipment and submitting bids for those items of interest to them. Brody of New Jersey answered Hermelin's question on procurement of teleprinters through private sources. Among Brody's quite extensive resources were:

Advertising in radio teletypewriter magazines; looking at ads put in by other people in these magazines and answering them.

Publicizing the existence of the TDI network via newspaper articles and TV news programs; sometimes these brought responses from interested people.

Cooperation among TDI agents is a necessity, according to Lankenau. They need to make headway with government officials to express their position and that of TDI. In order to acquire surplus government equipment, the buyer must have a license. Government agencies have first choice of the surplus equipment. Colleges and universities have second choice. Private individuals and agencies with proper authorization have third choice. It might be possible for TDI agents to arrange for schools for the deaf and colleges to acquire TTYs in this way and loan them to deaf families and organizations.

Dorsey and Ruby spoke briefly on the problems of convincing government officials to release TTYs to the deaf via TDI. It appeared that sometimes some telephone company officials still adhered to the policy of first, or even, only releasing surplus TTYs to radio amateurs. To summarize, the supply of TTYs is very limited. Used TTYs sometimes can be obtained from telephone companies, Western Union, railroad

companies, government surplus and other miscellaneous sources. It was suggested that agents keep in constant touch with the telephone companies, e.g., weekly calls. Mr. Marshall from the Chesapeake and Potomac Telephone Company wanted to be sure that the agents knew that in some areas, particularly large metropolitan areas, there are often several different phone companies, and it would be necessary to contact each individually. He also said that he expects the phone companies to have some Model 28s available soon.

Mr. Brody suggested another means of locating TTYs. The RTTY Journal (printed in Oak Ridge, Illinois, he thought) often has advertisements of small quantities of available TTYs--usually only one or two at a time. The RTTY Newsletter (printed in Ft. Lauderdale, Florida) also has announcements of available TTYs sometimes.

When the used machines are located, they are often in bad condition. Some may not be repairable, but if the agents want the machines they often have to pick them up immediately and they have to take the bad with the good. But bad machines can serve to supply parts for others. Storage is another complication. For example, where is the agent who lives in an apartment supposed to store TTYs while he is repairing them?

It was suggested that agents should understand the operation of the TTYs whether or not they are responsible for maintenance of the equipment since complaints are usually directed to them.

In discussing the limited supply of TTYs the following incident was mentioned. About one year ago the government dumped over one hundred surplus TTYs into the ocean. The agents agreed that this should never have been allowed to happen and that letters should be written to Congressmen to make them aware of this mistake and to prevent anything like this from happening again.

Marsters and Taylor urged concerted TDI efforts in obtaining machines from any and all sources.

At this time a lunch break took place. The agents and visitors had an opportunity to get acquainted with one another, as well as other people participating such as the interpreters and recorders of the conference.

After lunch, Mr. Robert H. Weitbrecht, a TDI agent from Redwood City, California, who is acknowledged "father" of the TTY network for deaf people due to his development of the original acoustic coupler used in the network, gave an interesting talk on the technical aspects of the telephone-teleprinter system. Copy of his talk is attached (Appendix B). This talk was well illustrated by slides showing details being discussed. These slides can also be found in the copy of his talk. Questions from the floor were answered by Bob after his talk.

The development of the TDI network has been helped along by other people outside of the TDI setup. An important source has been the Telephone Pioneers of America; this group is a service group made up of employees in the Bell System who have worked for the telephone companies 21 years or longer. The Telephone Pioneers in New Jersey helped Lee Brody organize a school for men who were interested in learning about the theory and operation and maintenance of teleprinters of the common model 15/19 variety (Appendix C).

In Los Angeles a similar project was undertaken by a local Telephone Pioneers group, working with Marsters. Several deaf men took the course and earned their 25-hour certificate in teletypewriter servicing.

Next, questions about interfacing our 5-level code (Baudot) with the newer 8-level code systems being used in teleprinter systems, particularly with computers, were asked and the whole subject discussed. The 8-level code systems operate on a 100 words-per-minute basis while the TDI network uses a 5-level code operating on a 60 WPM basis. The 60 WPM level had been arbitrarily selected in the early days of the growth of the network for the following reasons: most deaf people type less than 60 words a minute; many old TTYs available through the donation program, particularly the Western Union 100 Series machines, run at the fixed 60 WPM speed. This results in agents procuring 60 WPM gear sets to modify the TTYs they obtain that have 75 WPM gears. The consensus of this discussion was that interfacing with 8-level 100 WPM systems, involving bulky and expensive gear, is a subject for future consideration.

Community services afforded the deaf people were next discussed. Weather reporting systems came first and Taylor described the system used in St. Louis and Marsters that used in the Los Angeles area. St. Louis has a special

telephone and a modem with a 60 WPM perforated tape transmitter tied into an automatic answering device. The weather bureau uses the same 5-level code that the TDI network does; but transmission is at 100 WPM rather than at the 60 WPM at which TDI TTYs operate. Hence, a tape is already made each time the weather service updates its broadcasts; this tape is put on the 60 WPM transmitter and a deaf person merely dials the number of this weather bureau special telephone to get the weather report on his TTY. In time, however, the novelty of the scheme wore off, and fewer and fewer people maintained interest in these weather reports.

The scheme is different in Los Angeles, as described by Marsters (Appendix D). The usefulness is limited in that the deaf person must "tune in" at the times the reports are transmitted, whereas in the St. Louis type of service he can call in any time of the day to get the report.

The subject of answering services for the deaf was next discussed. The services so far established range both in "professionalism" and expense from the low scale to the high. Andrew Saks (Appendix E) described one such service in the San Francisco area, admittedly on the strictly "professional" side and hence rather expensive. Other answering services described were:

St. Louis - via Taylor - has its service manned by a couple who have 9 children. At two dollars per subscriber per month this service might qualify as the "check-rated" best buy in the country. The \$110 per month (for 55 subscribers) is a great boon for this large family in these days of inflated costs. The service is on a 24-hour basis, with late-hour calls being tacitly reserved for emergencies only. The common sense and tact of the subscribers are necessarily encouraged. There was the instance, for example, of the person who asked this answering service to "hunt" prices on a new car for himself.

Indianapolis - via - Breunig - has a shut-in invalid who has use of hands and arms and charges \$4 per month per subscriber. There are about 20 subscribers presently and there have been the complaints about "abuse" of the service. It is apparent that the ability of the deaf person to "reach out" via the telephone-teleprinter system has proved to be both a boon and a headache.

Harmelin reported the "answering service" as existed in Cleveland. Certain households possessing TTYs and containing

hearing spouses and/or siblings serve as "answering services"; 25 cents per call is charged for this service. This is almost analogous to the situation reported by Brody for the New York City metropolitan area, but in the NYC area nothing is charged for the service and people are encouraged to use these people who volunteer for "answering services" only in emergencies.

Washington, D.C. - Dorsey - has a crippled woman who was helped through the Bureau of Vocational Rehabilitation and the TTY owners in the locality to initiate the answering service. It started with 63 subscribers at \$4 per subscriber per month, but at last count there were only about 18. It appeared that people were also abusing this service. Also, since the appearance of a TTY "hot line" for deaf teenagers (like the counterpart for hearing children using a telephone) fewer young people perhaps had a need for the answering service.

Los Angeles has had two answering services which failed because the people somehow did not cooperate and use the service wisely. Teletypewriters for the deaf represent a new scheme of communications and apparently are reflecting some growing pains.

Mr. Lanckenau said that FISH, an Episcopalian organization, was willing (in Akron) to handle the 24-hour answering service and he suggested that other agents check to see if there is a FISH organization in their area. All they required was that someone supply them with a TTY and a modem.

Organizing people for community action is a hard enough task to accomplish with hearing folk using telephones. A shining example of what can be done was illustrated by Tom Rule of New England Communication Service for the Deaf (Appendix F). This example showed the hidden potential of the teleprinter for enhancing the lives of deaf people everywhere.

The conference recessed for the day at this stage. It was to resume on the next day, Sunday November 14.

The festivities for the evening planned by Mr. Pimental for the participants included a pleasant reception at the lovely home of Gallaudet President, E. C. Merrill, Jr., and his wife. Then afterwards there was a banquet at the Gallaudet College Student Union. Dr. Donald Torr, director of Educational Technology at Gallaudet, gave an interesting talk on

his view of technological innovations in the future for deaf people in their ever-continuing quest for better communications in this world of ours (Appendix G).

Sunday morning the conference resumed with a discussion of news services for the deaf, which, in TDI, consist of specially equipped teleprinters and automatic answering devices for the telephones so that deaf people may call in and get a message recorded from perforated paper tape. Paul Taylor told about the St. Louis "Hot Line" and how it was established. The automatic answering device and the controller for the news tape all were hand built by Taylor himself, with engineering and technical help from Bob Weitbrecht. Taylor reported that, initially, response to the service was very enthusiastic but, as with all such novelties, interest seemed to be flagging after two years "on the air".

The Washington Deaf Messenger (DTGW - for "Deaf Telecommunicators of Greater Washington" - News) was started by Bud Dorsey who built it from specifications supplied by Taylor of St. Louis. At the time of the conference, the service was temporarily disbanded pending removal from Dorsey's house to Gallaudet College. Pimental outlined plans Gallaudet has for the development of this news service. They hope to have 5 or 10 telephone lines so that 5 or 10 deaf people may call in simultaneously and thus reduce waiting time for people desiring to call in for the news of the day.

Tom Rule next described the New England Deaf Messenger - later changed to the Massachusetts Deaf Messenger when the Connecticut Deaf Messenger was launched - that he built initially from specifications supplied from Paul Taylor. Problems almost prevented the initiation of the service on schedule but a complete changeover to the automatic control unit and message control unit scheme devised by Weitbrecht enabled Rule to open on time. Rule reported the same initial high enthusiasm and use of the service as Taylor and Dorsey experienced. He commented on the fact that he found it hard to keep standards on his news service at a high level. His "news" consisted of a mixture of social, informative, technical and other news. He injected items dealing with technical matters pertaining to the TTY system, providing interesting subject-matter for the deaf person interested in non-technical explanations of the workings of his machine. And, as mentioned earlier in this paper, there was that time when the deaf messenger was used to transmit the urgent letter from the president of MASSCOSA. Rule said the phone rang continuously until about 2 o'clock in the morning and he was

sure practically every deaf person in Massachusetts knew about the news by that time.

The New York/New Jersey Deaf Messenger was started by Lee Brody using initially the same setup as Rule had in Massachusetts (Appendix H). In discussing the news service the main problems were the types of news to be given, the length of the news, and the cost of toll calls (e.g., in the New York, New Jersey metropolitan area).

In place of the current news service methods it was agreed that if the deaf people could get a frequency on the FM band it would be desirable. It would not even be necessary to have this frequency available for the teletype news service for 24 hours a day if that would make it any easier to acquire. Capt. Raish from the White House said he would be willing to suggest names of consultants and lawyers to help with this petition. He also said he thought we would have a better chance with cable television than with an FM frequency and that it might be making better use of our resources if we directed our energy in that direction even though it might take a couple of years.

There are other news services in the country. The one in Los Angeles is a simple one-tape model 19 configuration using automatic control and message control units. Another is in Houston, Texas and since there was no one from Houston in the conference, no report was given on that one.

Government surplus teleprinters were again brought up. Bud Dorsey spoke on how the Health, Education and Welfare (HEW) Department in the Government can procure almost anything if given a good reason for it. And also there was the brochure on how to bid on federal surplus property that was passed out to TDI agents some time ago. Information on this was given by Captain Robert Raish, visitor to the conference from the Office of Telecommunications Management, White House, who confessed he was not entirely aware of the TDI setup and said he would certainly be happy to look into the situation in the future. He added that he felt that the conference had much more to offer him than he had to offer the conference. Helpful comments also came from Mr. Robert Thill, Project Manager/Information, American Telephone and Telegraph Company.

Emergency Services for the Deaf via the TTY: Brody spoke about the "E" listing in the directory for the New York/New Jersey PTTY for the Deaf area. The "E" denotes a hearing person in the household who will relay messages of

an emergency nature. As mentioned previously, they also serve as a sort of answering service. Michael Moore from Dallas reported having made contact with the City Police Chief and exploring the thesis of installing a TTY in the police department for people to call in for emergencies like fire and situations calling for police response, as well as to call for an ambulance. (Note by editor -- This service went into effect in December, 1971) Breunig reported that the Sheriff in Indianapolis was being kept apprised of possibilities in this direction. Marsters reported a TTY installed in the Los Angeles County Sheriff's Communications Center in downtown Los Angeles and in operation. Instructions have been sent out to all deaf people on how to use the service. The sheriff's communications center will relay the message to the proper locality's police or fire department or ambulance dispatcher for action, per the address given to them by the caller.

Costs of services, fees for installing TTYs, etc., came up for discussion. Breunig wondered if fees for installing machines and repair services should be standardized around the country. Rule commented on the differences in fee scales in various places in the country and wanted to know about the possibility of TDI setting guidelines for determining fees. Taylor thought perhaps there should be a TDI survey of prices throughout the country. Saks commented that in the instances where there are missing parts, or incompatible parts needing replacement, the eventual customer should pay for those replacement parts. Marsters suggested a standard form from TDI explaining extraordinary charges if and when incurred. Lankenau wondered if there ought to be a policy from TDI pertaining to standards of installation. Breunig pointed out that the suggested information brochure about TDI could carry such information. Roach, from the Syracuse/Rochester, New York area, described servicing techniques. He has a friend who works for the telephone company who accepts toll calls from him, collect (since telephone company employees get free telephone privileges), and services TTYs for him with little or no charge at all. Moore wondered if we should have at least standard service call fees. Gordon Allen, from Minneapolis/St. Paul, described an averaging method. He based his charges on such an average, and if the "standard" ever promoted by TDI comes below his average costs, upon which he bases his charges, he would leave the TDI organization. And, if such charges were higher than his costs, he would also drop out as a TDI agent since he would not want to make any profits from deaf people. Dorsey and Lankenau also spoke at length on the subject. Lankenau particularly would like to see an

incentive program for the TDI agents. Saks was wondering if TDI would consent to be a "central purchasing agency" for procuring TTY parts. Breunig said this was not feasible within the present framework of the operations of TDI.

Brody commented on the supply of parts for teleprinters. He mentioned that Essco Communications Corporation of Camden, New Jersey, one of the suppliers of modems for the TTY market, has in stock a quite extensive inventory of parts for the teleprinters. Rule spoke about the TYPETRONICS outfit in Ft. Lauderdale, Florida which supplies him with many parts for various machines. The man to contact there is a Mr. Fred Schmidt.

The conference at this stage recessed for the brunch.

After the brunch the topic covered was TDI organization or reorganization for the future. Michael Moore of Dallas would like to see more involvement on the part of TDI agents - perhaps with equal representation from different parts of the United States. Marsters stressed that the organization should have flexibility. Rule gave a brief description of the structure of his New England Communication Service for the Deaf. At this point Breunig showed an overhead transparency of the distribution of TDI memberships by states (Appendix I), thus, indicating that there might be unequal representation in some places. Lanckenau wanted to know under what authority would such a reorganization of TDI take place?

Brody suggested a nominating committee to select a slate of officers for the newly reorganized TDI. After some discussion, the people gathered decided to have Breunig appoint an ad-hoc committee to study reorganization of TDI. Breunig is to appoint the members of this ad-hoc committee at a later date. Moore suggested that a technically oriented person be on the committee and Brody suggested also someone who is knowledgeable about contacts, etc., for teletypewriters. (Editors Note: Paul L. Taylor was subsequently appointed chairman of a committee on reorganization of TDI)

Standards for modem makers were briefly discussed, with the consensus that this was not feasible since TDI is not technically capable of investigating the various schemes presently being utilized.

Long Distance calls were next discussed. Topics were: petitioning the FCC for lower rates; tax deductions for such calls. Rates on long distance telephone calls for deaf persons

are much higher on the average than for a hearing person due to the time it takes to type a message. Two suggestions were made regarding reduced rates for TTY users. One was to petition the FCC for reduced long distance rates. The other suggestion was to check with the Internal Revenue Service to see if the cost of long distance calls could be deducted (for deaf people) as a medical expense in the same way that they deduct the initial cost of the TTY and modem. Breunig said someone should check into this. Marshall of the C and P Telephone Company suggested that TTY users make long distance calls during the evenings and on weekends in order to take advantage of reduced rates. Capt. Raish recommended using precut tapes to save time. One of the agents said that he often sent his message via tape long distance and then hung up and gave the other party time to prepare a tape with his reply. Then he re-placed his call and discussed the matter in question saving a few minutes time.

There was a discussion about the distribution, presently, of available donated teletypewriters. The following is a breakdown around the country:

St. Louis: 10 model 19's; none on waiting list

Omaha: no machines on hand

Los Angeles: about 15 model 15's; many of the RO (receive only - no keyboards); about 3 or 4 model 19's

Boston: 3 model 19's; 4 or 5 WU's and 35 model 15's

San Francisco: 6 or 7 model 15's; 2 model 19's; 3 or 4 model 15 RO's

Cleveland: 11 WU 2-B strip printers without end-of-page indicator lights; 1 model 19, not working; no one on waiting list

Wichita: 1 model 15 RO (keyboard on order); 7 on waiting list

Kansas City: 12 or 13 model 15's; 4 model 19's; 6 WU's; 1 model 28 (not working); 14 WU 2-B strip printers

Minneapolis/St. Paul: 3 model 15's; 3 model 19's; 4 or 5 model 15 RO's

Akron: no teletypewriters; 7 on waiting list; hopeful of getting some machines soon.

Washington, D.C.: 30 model 15 RO's with 5-inch sprocket-feed platens; 25 on waiting list; need at least 25 new platens

New York/New Jersey: 125 ITT-donated RO's, both 15's and 19's; 20 on waiting list for donated machines

Syracuse/Rochester: 3 model 15's (2 RO's); 1 model 19; no one on waiting list

Dallas: 2 B's in service, replacing them with model 15's as they become available; 25 on waiting list

Reports were given on the Phoenix, Arizona (where there are now about 9 or 10 TTY stations), Portland, Oregon and Seattle, Washington, situation by Marsters. He also commented on the international situation. There is a company in Canada which wants to sell model 15's for \$65 each. Roach spoke about the Canadian railways having surplus TTYs for sale but it was assumed it would be too much of an expense to transport them to the states.

The first national conference for agents in Teletypewriters for the Deaf, Incorporated adjourned at 3:00 p.m.

Attendance

TDI Agents:

Gordon Allen - Minneapolis/St. Paul, Minn.
H. Latham Breunig - Indianapolis, Ind.
Lee Brody - Fairlawn, N.J.
Henry Lee Dorsey - Washington, D.C.
Benjamin Hermelin - Cleveland, Ohio
Robert Lankenau - Akron, Ohio
James C. Marsters - Pasadena, Cal.
Michael Moore - Dallas, Tex.
Arthur Nelson - Omaha, Neb.
William Ragland - Kansas City, Mo.
Harold Roach - Mexico, N.Y.
George Ruby - Wichita, Kans.
J. Thomas Rule - Boston, Mass.
Andrew Saks - San Francisco, Cal.
Joseph Slotnick - Los Angeles, Cal.
Paul Taylor - St. Louis, Mo.
Robert H. Weitbrecht - Redwood City, Cal.

Visitors:

Dr. R. Orin Cornett, Vice-President of Gallaudet College
Miss Sally Law, Public Service Programs, Gallaudet College
Mr. Walter Marshall, Assistant Vice-President, Public Relations Chesapeake and Potomac Telephone Company
Dr. Edward C. Merrill, Jr., President of Gallaudet College
Mr. Albert T. Pimentel, Director, Public Service Programs, Gallaudet College
Captain Robert Raish, Office of Telecommunications Management, White House
Mr. Robert Thill, Project Manager, Information, American Telephone and Telegraph Company
Dr. Donald V. Torr, Director, Educational Technology, Gallaudet College
Miss Roslyn Waring, Public Service Programs, Gallaudet College
Mr. Joseph E. Wiedenmayer, Alexander Graham Bell Association for the Deaf, Inc.

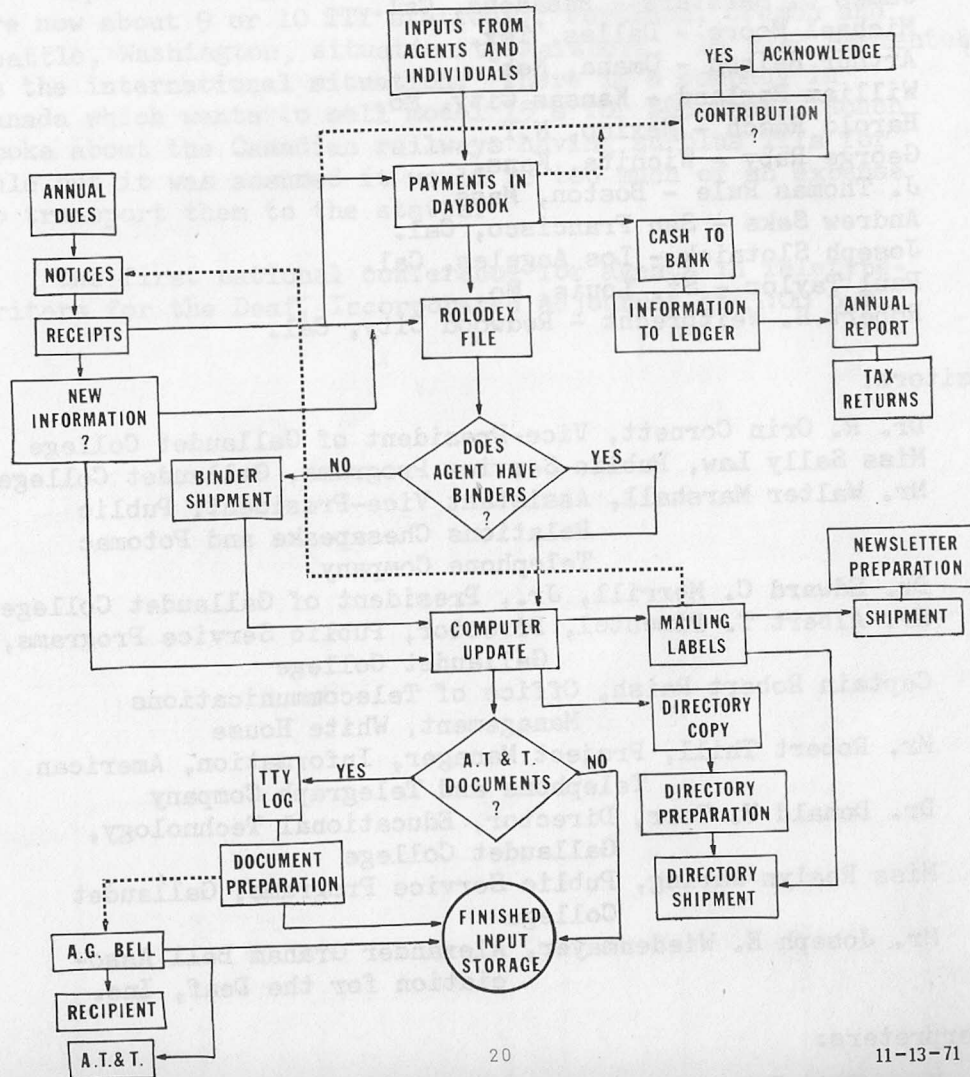
Interpreters:

Mrs. Dona Hoke
Mr. William Huston
Mrs. Shirley Jordan

A TELEPHONE-TELETYPEWRITER SYSTEM

By: Robert H. Weitbrecht

Appendix A

TELETYPEWRITERS FOR THE DEAF, INC.
INPUT PROCESSING ROUTINE

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11-13-71

Introduction:

Due to the limited time for presentation at the Teletypewriters for the Deaf conference, it will suffice to present basic principles of a telephone-teletypewriter system. Literature is abundant in this direction, and appropriate references will be given.

A telegraph circuit consists of two parts; (I) a key, for sending signals, and (II) a sounder, for receiving signals. Connected to a battery, as shown in Figure 1, this arrangement can only talk to itself, as there is only one station. Now, the same telegraph circuit can be expanded to include two stations, separated by a connecting "line". As Figure 2 shows, this line may consist of one copper wire plus a ground return. Better performance would require two wires. Either way, this gives one channel through which messages can pass.

Normally, a two-station telegraph system is operated in such a manner that one end can talk to the other end at one time, and then the other end can respond to the first end at another time. This is similar to ordinary conversation going on between two persons. This is called the simplex mode or method. Alternatively, if one end has the ability to interrupt the other, this becomes the half-duplex mode. Then, there is another mode, called full-duplex; briefly it is like two persons "talking to each other at the same time", with different messages. This mode, however, requires two separate channels, one in each direction. It is much used in computer applications.

The telephone-teletypewriter system, herein described, is capable of operation on a half-duplex basis. Timing considerations are involved. As can be seen, this also involves consideration of various factors, such as kind of messages, signaling speeds, and telephone-line characteristics.

The Teletypewriter:

The teletypewriter is a telegraph system with a built-in code, so that the equipment takes on the appearance of an ordinary typewriter, quite usable by anyone who can at least

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