

CAPTIONING FOR DEAF PEOPLE: AN HISTORICAL OVERVIEW

In: Harkins, J.E., & Virvan, B.M. (Eds.)
Speech to Text: Today and Tomorrow.
Proceedings of a Conference at Gallaudet University,
Washington, DC, September 1988.
Washington, DC: Gallaudet Research Institute.

by
Malcolm J. Norwood
1988

September 1988 marked the 30th anniversary of the first truly successful captioning undertaking for persons who are deaf. Public Law 85-905, which created the Captioned Films for the Deaf program, was signed by President Dwight D. Eisenhower on September 2, 1958. As a result, deaf Americans once again had access to the motion picture, which became inaccessible with the introduction of sound in 1927. One other extraordinary event also took place that year. This was the broadcast of a rough image of a dollar sign by P. T. Farnsworth.

The sound motion picture, or “talkie,” quickly became the true “silent film” for the deaf population, which could no longer completely follow the action. Interestingly enough, it took approximately 30 years to provide deaf persons with a captioned film program, and another 30 years after television became widespread around 1950 to have access to captioned television.

Early efforts to overcome this lack of entertainment were instigated by Emerson Romero, a deaf man, who acquired some sound motion pictures and spliced in the dialogue or explanatory text in the same fashion as the old “silents.” Commendable as this effort was, it had no real chance of succeeding due to the lack of adequate funds for acquisition, preparation, and distribution. Nevertheless, Emerson Romero was a true pioneer, and his attempt to overcome this dilemma should never be forgotten.

The next effort, which was more successful and proved to be the forerunner of the current federal program, was the creation of Captioned Films for the Deaf, Inc., in Hartford, Connecticut, by Dr. Edmund B. Boatner, superintendent of the American School for the Deaf, and Dr. Clarence O’Connor, superintendent of the Lexington School for the Deaf. This was made possible by an initial gift of \$5,000 from the Junior League of Hartford, which later gave another \$2,500. The films circulated by this nonprofit organization were the first truly captioned films, as the captions were etched directly onto the film.

Much credit for the progress made at Hartford goes to J. Pierre Rakow, a deaf man and supervising teacher of the Vocational Department of the American School for the Deaf. An extraordinary person of many skills, Rakow not only learned how to caption films, but pushed, hauled, persuaded, and goaded people in the industry into recognizing the need and their responsibilities to provide an opportunity for deaf people to once again have access to the motion picture.

As with Emerson Romero’s efforts, it soon became quite clear that the corporation was too small to adequately meet the needs of deaf Americans. Consequently, Dr. Boatner and others decided to approach the Congress of the United States. Precedent had already been set by the Talking Books Program for the Blind, which had been established in 1933. Why not a similar program—a loan service of captioned films for deaf persons? Thus, in 1958 the cultural, educational, and general welfare of this population was greatly enhanced by the creation of the Captioned Films for the Deaf program. A part of the United States Office of Education, the program began operation with its first appropriation of \$78,000 in 1959, and since then has contributed greatly toward bringing deaf persons into more direct contact with the larger social environment. The Hartford corporation was dissolved and its library of 29 captioned films was donated to the federal government.

Although the initial purpose of the Captioned Films program was to provide subtitled Hollywood films for deaf people, educators were quick to recognize the potential of captioned films and other visual media as tremendous untapped educational resources. Consequently, the Congress amended the original law several times. The more significant amendments, for the purpose of this article, were Public Law 87-715 (1962), which authorized research, training, production, acquisition, and the distribution of

educational media; and Public Law 89-258 (1965), which authorized the distribution of media equipment.

As a result, Captioned Films for the Deaf became involved in designing educational materials to meet the unique learning needs of deaf students. Very briefly, the expanded authority resulted in a number of field services and projects, which included at one time four regional media centers for deaf people, each with a major emphasis. New Mexico State University focused on programmed instruction; the University of Massachusetts on audio-visual technology; the University of Nebraska on film; and the University of Tennessee on instructional television. While these centers no longer exist, they played a major role in the program's development. Currently, there is a nationwide distribution system which includes 58 captioned educational film depositories and an evaluation and selection system to determine which films, educational or theatrical, are added to the program each year.

The program's work with the motion picture industry during the 1960s provided insight into problems that would have to be faced in the captioning of television. For example, it was learned that foreign movies are generally dubbed rather than captioned because many viewers do not like subtitles. It was also learned that decisions in the media industry are based on market statistics. Convincing television networks to caption would require data about the numbers of hearing impaired persons who would watch captioned television programs.

In order to ascertain the acceptability of captioned television to hearing viewers and to obtain data on the potential market, the program contracted for a research study with HRB-Singer, Inc. of State College, Pennsylvania. The most significant finding of the Singer study pertained to the acceptability of captioned programs to hearing viewers. A survey was conducted to monitor responses of hearing viewers to two captioned Disney movies shown with special permission over a cable television station in Centre County, Pennsylvania. The movies were "Big Red," a story about a French Canadian boy and an Irish setter, and "Bear Country," a documentary about North American black bears. The results showed that approximately 70% of the 229 viewers were not bothered by the captions, and it added to some people's enjoyment. Approximately 25% to 30% of the viewers were bothered to some degree by captioning. The survey also showed that while 17% to 29% of those responding indicated that captioning of the more popular programs (news, prime time movies, sports, evening situation comedies, etc.) would bother them, only 10% expressed a negative reaction toward the notion of general captioning. When the respondents were asked what their general reaction would be to captioning only *selected* television programs, 47% said they would react favorably, 43% said they were neutral, and 10% had an unfavorable reaction.

Although program staff were encouraged by the study's degree of positive response to captioning, it was understood that commercial networks are intensely competitive. Staff members believed the networks would not risk losing even a fraction of their hearing viewers. Also, no firm data on the number of hearing impaired persons who would be viewing captioned programs were available. Statistical data varied from approximately two million to 20 million. Program personnel felt the networks would calculate that the 10% who reacted unfavorably to captioned television in the study would be larger than the deaf population. This was based at that time on an estimated hearing television audience of 200 million. It seemed extremely unlikely that the networks could or would compensate for any loss of hearing viewers. This conclusion intensified the determination to pursue various developing forms of technology that would permit captions to be displayed *only* on the screens of hearing impaired viewers whose sets were specially fitted to display captions without interfering with the reception of hearing viewers.

The next major event in the evolution of captioned television was the First National Conference on Television for the Hearing Impaired in December of 1971 at the Southern Regional Media Center for the Deaf located at the University of Tennessee. This conference brought together persons from across the country who were interested in making television accessible to hearing impaired persons. Participants included hearing impaired persons, parents, producers, representatives of federal agencies, and, most significantly, representative of the major networks.

The conference featured a preview of the open-captioned version of Julia Child's "The French Chef," which was captioned by WGBH of Boston under contract with the program. It also included a presentation of two possible technologies for captioning television that would limit captions to specially equipped sets. One system, developed by the HRB-Singer Company, transmitted the captions in a portion of the video signal that was normally received off the edge of the picture. One of the major networks criticized this method of presentation on the grounds that it might intrude on hearing viewers' pictures due to variations in reception and that use of sets to receive captions in this manner might reduce the life of the picture tube. Another system, developed by the National Bureau of Standards (NBS) to carry time and frequency information, transmitted captions in a portion of the video system that was unused in normal transmissions. This portion of the signal is known as the vertical blanking interval. This system was exhibited with the cooperation of ABC Studios in New York with a captioned presentation of the program "Mod Squad."

The conference provided a unique opportunity for informal discussions among deaf persons, representatives of deaf organizations, parents, and television industry representatives. Conference participants concluded that the programs should inform the broadcasting industry of the technological potential for captioned television and should pursue the development of the NBS system of captioning.

During January of 1972, program staff met with a subcommittee of the National Association of Broadcasters to discuss the feasibility of captioned television. This subcommittee studied the issue, and in June of 1972 indicated that this type of captioning was technically feasible, but said certain steps had to be taken before such captioning could become a reality. Basically, the steps were:

- an effective decoder would need to be developed;
- a single system would need to be developed; and
- extensive field tests of the entire system, including receivers equipped with decoders, would be necessary.

In addition, other questions to be answered included:

- the cost-effectiveness of such a system;
- the length of time required to caption a program;
- the cost of captioning a program;
- the cost of equipment to broadcaster; and
- the cost of the decoder.

In order to accomplish these goals, a network had to be involved. Since Public Broadcasting Services (PBS) is quasi-government and because interest in the project was firm, the U.S. Department of Education contracted with PBS to do a feasibility study. It should be mentioned that among the

commercial networks, ABC continued to support the project from its inception by providing technical assistance and advice as needed. In brief, closed-captioned television resulted from the following milestones:

Fall 1972

A contract was signed with PBS to begin development and testing of two Line 21 concepts—one from NBS and one from Hazeltine Research, Inc. (NBS was ultimately selected.)

Fall 1974

PBS began development of prototype decoders under contract.

Fall 1974

The Federal Communications Commission (FCC) provided temporary authority for an over-the-air test of the Line 21 system using prototype decoders at 12 selected PBS stations nationwide.

Nov. 1975

Testing results led PBS to petition the FCC for permanent authority to broadcast captions on Line 21.

Dec. 1976

The FCC approved permanent petition.

Fall 1977

Under contract, development began on a self-contained adapter and the built-in decoder for home television sets.

Fall 1978

Under contract, development of caption-editing consoles began.

March 1980

Closed captioning officially began on ABC, NBC, and PBS.

There are two things missing from this chronology. These were purposely omitted because some discussion is necessary. The first of these is the creation of the National Captioning Institute; the second centers on why Sears was the only decoder retailer when decoders were made available in 1980.

During the development of the closed-captioned system there were two issues that needed to be resolved: the cost of captioning a program and who would supply the captioning. The cost of captioning had been a point of contention between the networks and the project, and was an issue during the FCC hearings in 1976. PBS had estimated captioning cost at approximately \$1,500 per hour while network estimates were much higher. Finally, ABC raised the idea of a nonprofit, free-standing captioning institute to supply captioning for network programs at a low cost. This led to further discussion, which led to certain conditions to ensure participation—one of which was captioning at a rate of no more than \$2,000 per hour. Thus was born the concept of a national captioning institute to be located in the Washington area because of the proximity to PBS-trained personnel and equipment. A West-Coast office in Los Angeles would later be established to handle the needs of program producers concentrated in that area. In the spring of 1979, Joseph Califano, secretary of the Department of Health, Education and Welfare, announced the creation of the National Captioning Institute.

Another issue to be resolved at that time was the manufacture and sale of decoders and television sets with built-in decoding equipment. Following a lengthy exploration of manufacturing and distribution sales which were generally negative, Sears, Roebuck and Company was the only firm consenting to become involved. Sanyo, the company that manufactures television sets for Sears, would produce the decoders in Arkansas and Sears would market them through its catalog. Today, closed-captioned decoders are available from a variety of retailers.

At this point, it should be noted that while the closed-captioned system was being developed, the desire for some captioned TV programming resulted in experimentation with open-captions on the PBS television network. Program staff contacted WGBH of Boston. The following resulted:

1971

Funding was provided to open-caption Julia Child's "The French Chef" on an experimental basis. The contract was expanded to caption the series.

1971-1978

Funds were provided for open-captioning of a variety of programs, including the then-popular children's program, "ZOOM."

1973-1981

Following an experiment to caption President Richard Nixon's inaugural address in 1973 (which proved the feasibility of taking an event off the air and rebroadcasting it with captions), funds were provided for open-captioning of ABC's evening news on the PBS network. Although the captioned rebroadcast was televised approximately five hours later, this was the first time deaf people had access to a current national newscast.

While the federal government provided funds for start-up costs of the National Captioning Institute, it was anticipated that the system would eventually be self-supporting. The implementation of the closed-captioning system, with commitments from ABC, NBC, and PBS, seemed to support this contention. However, sixteen hours of closed-captioned programming per week and the unstable state of the economy at that time had a profound effect on the sale of decoders, which, after a fast start, slowed down. The result was a "chicken or the egg" situation. Larger decoder sales would mean increases in quality, volume, and variety of closed-captioned programs. People were hesitant to purchase decoders because the number of programs was limited. The networks were hesitant to increase their commitments because the number of people with decoders was limited. Increasing one would clearly increase the other. The question was whether to wait for "the other" to happen. To do so would most likely endanger a considerable federal investment as well as the continued existence of the system. It was determined that the major factors for the poor sale of decoders were:

- the depressed state of the economy
- the lack of a captioned prime time national news program, which hearing impaired persons cited as top priority
- insufficient numbers of closed captioned programs
- an unrealistic expectation by some purchasers that decoder prices would decrease in spite of the fact that the retailer mark-up was slightly above the actual production cost.

Making use of the statutory authority which allowed support for captioned film activities and other projects that led to the development of captioned television appeared to be the best solution to protect

the federal investment and to encourage the purchase of decoders. The program began to issue Requests for Proposals (RFPs) to increase the number of programs available, to assist in reducing the cost of decoding equipment, and to encourage more private sector support. The result has been an exciting blend of public and private support. RFPs were issued for:

- closed-captioned prime time movies, specials, and regular program series
- the manufacture of decoder chips (thus providing a subsidy to assist in reducing costs)
- real-time captioning of national newscasts in prime time
- closed-captioned children's programs
- closed-captioned syndicated programs
- closed-captioned sports program
- closed-captioned local news programs with seed funding for up to three years to encourage local community support for permanent captioning.

As early as 1978, the program began to fund developmental work in real-time captioning with the objective of making it possible to caption live programs, i.e., news, sports, the Academy Awards, space shuttle launches, and other live events. This developmental work, however, did not result in the system finally used. The Central Intelligence Agency (CIA) was exploring a system which would allow the spoken word to appear in printed text. As it turned out, a private concern resulted from the CIA project, Stenocomp, which marketed computer translations to court reporters. The Stenocomp system relied on a mainframe computer and was thus too cumbersome. However, when Stenocomp went out of business, a new firm developed—Translation Systems, Inc. (TSI) in Rockville, Maryland. Advances in computer technology made it possible to install the Stenocomp software into a minicomputer. This made it possible for the National Captioning Institute to begin real-time captioning using a modified stenotype machine linked to a computer with a cable.

On October 11, 1982, the first real-time closed-captioning took place with the broadcast of ABC's "World News Tonight." Since that time, real-time captioning has been applied to other situations, including classroom experiments at the National Technical Institute for the Deaf; the Supreme court to allow a deaf attorney to understand the justices and other attorneys, and at numerous local, state, and national meetings of deaf people.

This author has made every effort to cover the overall development of captioning. Because of the magnitude of this effort, it is possible there are some omissions, unintentional as they may be. The major events are included, and it would require a major effort—a book, in fact—to cover everything. This effort has been mainly directed toward television, which perhaps is more appropriate to the conference, *Speech to Text: Today and Tomorrow*. Obviously, deaf people can still dream of what is yet to come. Tomorrow, if and when the problems (and there are many) are overcome to the point where speech can accurately and conveniently be converted to print, captioned television will be a complete reality, as will the telephone and other communicative devices. It will happen; and when it does, the doors of communication will be opened wider than ever, bringing a new dimension to the lives of hearing impaired people.

BIBLIOGRAPHY

Block, M. H. & Okrand, M. (1983). Real-time Closed Captioned Television as an Educational Tool. (Computer assisted research and instruction for the hearing impaired.) *American Annals of the Deaf*, 128 (5).

Boatner, E. B. (1981). Captioned Films for the Deaf. *American Annals of the Deaf*, 126 (5).

Crane, D. (1985). Writing for Closed Captioned Television for the Hearing Impaired. *IEEE Transactions of Professional Communication*, PC 28 (4).

Norwood, M. J. (1976). Captioned Films for the Deaf. *Exceptional Children*, 43 (3).

Norwood, M. J. (1976). *Comparison of an interpreted and captioned newscast among deaf high school graduates and deaf college graduates*. Unpublished doctoral dissertation, University of Maryland.

Norwood, M. J. (1980). Just Don't Scramble the Wrong Egg. In B. Braverman & B.J. Cronin (Eds.), *Captioning: Shared perspectives*. Rochester, NY: National Technical Institute for the Deaf.

Proceedings of the First National Conference on Television for the Hearing Impaired (1971). Southern Regional Media Center, University of Tennessee.

Root, R. T. (Ed.). (1970). *An analytical and experimental investigation of means of enhancing the value of television as a medium of communication for the hearing impaired*. Study done by HRB-Singer under contract to Media Services and Captioned Films, U.S. Office of Education, 1970.

Schein, J. D. & Delk, M. T. (1974). *The Deaf Population of the United States*, National Association of the Deaf.

QUESTION AND ANSWER

Question: When one is developing a new technology, you can take existing technology and adapt it to a special population or develop a separate technology for a special population. In Switzerland and in Europe, they took one technology and adapted it to various communities. Could you comment on the United States' approach to developing entirely separate technologies for the deaf population?

Answer: *Well, when we first began to develop Line 21, a Teletext system was being developed roughly about the same time. I think Teletext is a wonderful system, no question about that. It doesn't matter to me what system we use. When we selected Line 21, we made use of the system that we had available. For example, I was invited to Australia back in 1981 to help convince the Australian government to support captioning for deaf people. The system in Australia is Teletext. It's not a question of Teletext. The simple fact is that in this country, Teletext never caught on. If we don't have Teletext in this country, how can we provide captioning on Teletext? Teletext was not developed for closed-captioning per se. We had to make use of the system we had available to us, and the best way to go at that time was to develop on Line 21. That's the only answer I can give you.*

Question [Charles Estes]: You said that Teletext was developed at the same time Line 21 was, but that was the NBC and CBS system, which is a dead format. We know that today the World System Teletext (WST), which European countries use, is a much more dependable format. And we know that there are as many TV sets with World System Teletext built in as

there are Line 21 decoders today. And we also know that the EIA [Electronic Industries Association] is supportive of the WST format. Is it feasible to convert the whole system to a WST, or what is the reason for continuing with Line 21 only?

Answer: *Some of you will recall that CBS was pushing for a Teletext system in this country. Captioning is only one small part of Teletext. If you have a complete Teletext system in this country used by all the networks, fine. You can have closed-captioning and Teletext. But Teletext did not catch on in this country. Where is it? It's not being used in this country, so what do we have? The alternative is on Line 21. If we had sat back and waited for Teletext to appear, we wouldn't have any closed-caption TV today. We would still be sitting here waiting for it. That is the best answer I can give you.*

Comment [Jeff Hutchins]: The World System Teletext cannot provide real-time captioning. At least not in the way we have seen it [during the conference]. It is a limitation of the World System Teletext decoder. Also, it cannot work with home videotape. Even if World System Teletext were adopted by the networks and other program suppliers, and even if decoders were readily available, I don't think that in the foreseeable future the system of Teletext is an answer for the needs of the deaf community. I agree with you that Zenith has made many Teletext TV sets available and they are out there right now, but they are not being used to receive captions. Even if World System Teletext took off and was successful, too many services now enjoyed by decoder owners would be lost.