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ABSTRACT

A producer of captioned films for the deaf describes the role of The Public Broadcasting System (PBS) in providing captioned television programming for the hearing impaired. It is explained that PBS has been working on a closed-caption production and transmission system for the hearing impaired. Recounted are Federal Communications Commission rulings and commercial television networks' opposition to the trend. (CL)

OPENING THE WORLD OF TELEVISION TO THE HEARING IMPAIRED THROUGH CLOSED CAPTIONS

by

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I bring you greetings from the Public Broadcasting Service in Washington, D.C. Some of you may not realize that PBS is the world's largest television network--a national organization of 267 member stations, most of which are linked by a complex interconnection system.

It is in this context of a large and noncommercial TV network dedicated to serving the needs of all Americans that PBS has emerged as the moving force behind a monumental effort to make accessible to non-hearing Americans the same wide spectrum of television programming that is so easily and freely available to their hearing peers today.

To fully appreciate the importance of the PBS closed-captioning project, one must first of all understand the difference between the terms "open" and "closed" as applied to the printed messages called "captions." It's as simple as the words "visible" and "invisible" or "seen" and "unseen."

The concept of "open"(visible) captions which appear on all home screens is not new, of course. And to add "open" captions to television programs is an obvious solution to the problems of hearing-impaired viewers. Unfortunately, however, the vociferous objections of hearing people to what they consider an annoying intrusion on their own viewing pleasure make "open" captioning a strictly limited service and available only in non-primetime hours.

And that brings us to the second major contributing factor requisite to your understanding of the PBS closed-captioning project. "Open" captioning as a service to the hearing-impaired population has been and will continue to be firmly rejected by the television broadcast industry in deference to the demands of that larger group who can hear. Have you ever seen open captions on a regular commercial TV show (except foreign films)? Even some PBS stations, dedicated as they are to serving minority groups neglected by the commercial networks, are reluctant to annoy the bulk of the local public on whom they depend for financial contributions. WGBH's "Captioned ABC Evening News" is fed over the interconnection at 11:30 pm (ET) and the PBS programs which are captioned in Washington are scheduled in primetime slots for the closed-caption feeds, but the weekly repeats with open captions go out at inconvenient hours for the majority of viewers.

Therefore, it has long been obvious that "open"-style captions are totally impractical as a way to extend to non-hearing people all the information, education, and sheer entertainment enjoyed by the hearing masses.

Another method had to be found, and it has been. It now is possible to transmit captions nationwide in such a way that the general public is totally unaware of their presence in the regular television signal. This revolutionary technique is the core of the PBS closed-captioning project.

In prelude to bringing you up-to-date on present status, it may be desirable to capsulate developments leading up to this point. The concept of inserting hidden information in the broadcast signal is as old as television itself. Since the mid-'50's, TV programs received in our homes have often contained special test waveforms without our knowledge. By the late '60's, continued advances in electronic circuit technology made it evident that more widespread and sophisticated use could be made of such hidden signals, and developmental work with the basic concept got underway. The National Bureau of Standards, for example, began to evaluate the new technology as a means of disseminating time and frequency information over television broadcast airwaves. Interestingly enough, it was a commercial network (ABC) that first suggested modifying the National Bureau of Standards' signal format for adding closed captions to television programs for the benefit of hearing-impaired Americans. After demonstrations of such an application (in December 1971 at the University of Tennessee, Knoxville, and in February 1972 at Gallaudet College in Washington, DC), interest in future development was generated at two strategic locations: the National Association of Broadcasters (NAB) and the United States Department of Health, Education, and Welfare (HEW). A special subcommittee established by the NAB reported in June 1972 that the closed-transmission system, while seeming to be technically feasible, required certain research and development steps to be accomplished. The PBS engineering staff was represented on the NAB committee and therefore understood the full extent and scope of work to be undertaken in developing both

encoding and decoding units to be required for a viable closed-caption transmission system. Subsequent discussions between PBS and HEW resulted in establishment of the PBS closed-captioning project in February 1973, with funds appropriated through HEW's Bureau of Education for the Handicapped. Major goals for Phase 1 were to determine:

a) the general acceptability of captioned television by hearing-impaired persons,

b) the characteristics of a suitable transmission system, and

c) the broadcaster-associated costs of captioning.

This project, unlike earlier captioning efforts, began with research --- both technical and empirical. Under Special Temporary Authority granted by the Federal Communications Commission, over-the-air tests began in March 1973. PBS subcontracted with NBS to furnish 20 pro-type decoder-receivers for test purposes and with Gallaudet College for analysis of data to be collected from sample audiences at 12 test-sites across the country. Meantime, PBS began to develop a mini-computer-based captioning process and recruited me from the University of Tennessee to handle the program selection and caption-production tasks associated with the project, especially suggestions through experience for designing an efficient computer-assisted method for producing captions for closed-system transmissions.

By the end of Phase 1 (the experimental phase), PBS had important information on which to base the next steps. From analyses of data collected from over 1400 test-audience questionnaires, PBS was able to establish certain minimum or maximum guidelines related to the

captions themselves, e.g., presentation rates, editing procedures, size of characters, background shading, and other factors related to visibility and readability. We had also learned that 96 percent of hearing-impaired respondents wanted to buy a decoder for home use although no cost figure was mentioned on the questionnaire. At the same time, PBS engineers had thoroughly evaluated two closed-caption transmission systems and were ready to select a basic delivery system and proceed with modifications for the decoding unit, the "little black box" which will be mass-produced by TV manufacturers and made commercially available for home use either as add-on or built-in device. But that's only one-half of the necessary equipment for closed-caption production.

There is a common and very alarming misconception abroad that the long-awaited little black box (the decoder) will magically bring words to the home television screen. This, of course, is not the case. Those captions must first be encoded on the broadcast tape--and the only equipment which can be used to perform this task is the prototype at PBS headquarters in Washington, D.C. The final model is expected to be installed at PBS by early 1978. We call it, in non-technical terms, the "stand-alone captioning unit," and it is a necessary corollary to the decoder bofore captions can appear on home TV screens. So, the fact that PBS stations nationwide are presently broadcasting regular primetime programs with open captions is far more than just "an interim service" to hearing-impaired viewers. The open-captioned feeds of these programs over the PBS interconnection are merely a byproduct of a far more significant and worthwhile service to the nonhearing population - - and that is the

development of a complete encoding facility, featuring its own mini-computer program which over the past three years and even yet is being modified and refined through continuing experience with actual caption-production at PBS. These are always programs selected from the regular evening schedule, major series such as THE ADAMS CHRONICLES; MASTERPIECE THEATRE; UPSTAIRS, DOWNSTAIRS. Currently being captioned each week are the NOVA science series and ONCE UPON A CLASSIC, which is classified as "children's programming" but is captivating audiences of all ages. Other major program series will follow during this interim period and will continue to be offered to all PBS member stations with open captions. Technical and operational specifications for the stand-alone captioning unit (the encoder) will be made available to national TV-production centers for all networks in time for any who wish to gear up for closed-caption production to do so before the decoders for home use hit the open market. One is worthless without the other.

Over three years of research and development work at PBS brought us to the most critical step of all. Before closed captions on all networks and open captions on home TV sets could become reality, the Federal Communications Commission (FCC) had to rule that a portion of line 21 of the vertical blanking interval of the television broadcast signal would be reserved for closed-caption transmissions. PBS submitted this petition to the FCC for rulemaking in late November 1975. The FCC, already well aware of the closed-captioning project through its several renewals of the Special Temporary Authority for conducting project activities, immediately assigned a number to this document (RM-2616) and, less than three months later, issued a pro-

posed rulemaking together with the usual invitation for "comments." A crash publicity campaign from PBS through all major communication links with nonhearing people and their friends brought a deluge of letters to the FCC in support of RM-2616. A simultaneous drive directed at the nation's lawmakers resulted in strong support from many Senators and Representatives on Capitol Hill. But the FCC's tentative affirmative action also instigated strong opposition from powerful forces in the broadcast industry -- chiefly from the commercial networks (who presumably foresaw themselves being forced by pupular demand into regular closed-caption production, although there was nothing mandatory in the PBS petition itself) and also from certain national engineering organizations (who appeared to be hesitant about giving up the valuable television "real estate" represented in line 21).

The anticipated cost of captioning, for example, is still being viewed with alarm and enormously inflated figures by CBS, NBC, and ABC. Actually, PBS anticipated this hurdle from the beginning, and major attention has been given to keeping down broadcaster-associated costs. Even now, with the weekly captioning of primetime programs a routine part of the total project, the caption-production staff at PBS consists of only two persons who also have numerous and important other duties as already pointed out. This cost-intensive feature is one of our carefully conceived strategies for demonstrating to the television industry that captioning as a routine function of production need not require a large professional staff, just a competent staff. The total closed-captioning project, of course, is massive and involves many other people at PBS -- in particular, some of the nation's

top electronics engineers and computer specialists.

To every adverse comment submitted to the FCC by these powerful opposing forces, PBS firmly and objectively responded with factual data based on more than three years of intensive and extensive experimentation and regular delivery of closed and open captioned programs to all PBS stations. At the same time, the enormous groundswell of support across the nation accelerated. Organizations such as the National Association of the Deaf, the Alexander Graham Ball Association for the Deaf, the National Council of Churches, and others adopted and sent to the FCC formal resolutions in support of the PBS petition for rulemaking on Line 21. In addition, the massive write-in campaign to the FCC and also to Senators, Congressmen, and the White House contributed enormously to the final victory in this battle. On December 10, 1976, the Federal Communications Commission issued the required rulemaking by unanimous vote.

This FCC approval for the use of Line 21 was an important milestone in the project and cleared the way for final steps, namely, (1) mass producing low-cost decoders for home use, (2) training captioners for employment at major production centers nationwide, and (3) persuading commercial-network producers to invest in the encoding equipment and professional staff for adding closed captions to their programs before broadcast. The first of these goals is already underway. Invitations for bids went to major television manufacturers from PBS last month, and bids began to come in just last week. It is now estimated by PBS engineers that the decoders may be on the market within 18 months to two years.

But the battle isn't over by any means. The FCC ruling does not make closed captioning mandatory. Implementation is left to individual network decisions. Only PBS has expressed the intent to expand its closed-captioning ability so that most PBS-distributed programs will carry encoded captions when the home decoders become commercially available. PBS President Larry Grossman has also established an inhouse Task Force which includes three Senior Vice Presidents. The basic function of the Task Force is to develop timetables and strategies for interfacing the Closed-Captioning Project with the television industry and the target audience.

This will be a monumental effort, because the commercial networks are still firmly opposed to closed captioning. They aren't convinced that the hearing-impaired audience is large enough or interested enough in buying dedoders to make it economically feasible for them to spend the time and money for adding closed captions. We're going after them in various ways, and we'll appreciate any strategies you may suggest.

During the past quarter-century, television has grown to become perhaps the most powerful outside cultural force in American families. The average household watches TV (or at least has the set on) for more than six hours a day, according to the Neilson monitoring agency. The households with more than one set (43 percent of them, says Neilson) watch TV an additional six hours per week. These figures mean that Americans devote more time to watching television than to any other activity except sleeping and working.

Surveys among hearing-impaired individuals indicate that they, too, have at least one TV set in their homes, but they don't spend nearly as much time watching television because most of the programs - - with the notable exception of sports - - are meaningless to non-hearing people. The Gallaudet audience evaluation report (mentioned earlier) stated that all but a small percentage of respondents had television sets in their homes, but the majority watched television less than 11 hours per week. Some critics glibly say they're better off without being exposed to the violence and general inanity of much TV programming. But no one can deny that hearing-impaired people should have the same access to television and the same freedom of choice enjoyed by other American citizens. That, in a nutshell, is the prime goal of our Closed-Captioning Project at PBS: that hearing-impaired people may sit in their own homes and watch the same programs at the same time with the same enjoyment and understanding as their hearing friends.

For us as educators of the deaf, there is a far more compelling reason to have captioned television. It can be a powerful educational tool. Captions which are faithful to the narrative audiotrack (that is, carefully edited instead of being rewritten and watered down), captions which are written with precise semantical and grammatical construction can bring a new dimension to the education of hearing-impaired children (and, indeed, other learning disabilities as well). This type of captioning directly attacks all the problems with language encountered by non-hearing individuals in a hearing world. This type of captioning, most obviously, promotes improved reading skills. This type of captioning also builds vocabulary and fluency in

language, correct grammar and sentence structure, and improved critical and valuing skills. It was this recognition of the enormous benefits of good captioning to the education of deaf learners which launched me into the field of caption-production several years ago at the University of Tennessee in Knoxville, including a small research project which was subsequently reported in the American Annals of the Deaf under the title, "Use of Graded Captions with Instructional Television for Deaf Learners."

I've been producing captioned programs ever since. During the past almost four years of captioning for the Public Broadcasting Service in Washington, I've had the opportunity to caption just about every type of television programming - - even two comedies for Norman Lear (one episode each from his GOOD TIMES and MAUDE series). All these experiences and the feedback from hearing-impaired viewers and from educators of the deaf have strengthened my basic philosophy toward caption production, which is this:

(1) The population to be served by TV captions ranges from the profoundly deaf to those with only partial hearing loss and/or some lipreading skill, from the low-verbal prelingually and unschooled deaf to the high-verbal adventitiously and well-educated hearing impaired. Between the two extremes are multitudinous varieties of hearing loss, educational levels, and assorted special abilities or disabilities in addition to hearing impairment. In other words, deaf people are not different from the general population except in degree of hearing.

(2) In order to serve such a disparate audience, captions must

be meticulously geared to the audiotrack. The key word is PRECISION - - in both content and timing. To oversimplify the content abuses the integrity of producers and insults the intelligence of the total target audience. Additionally, any delay between spoken words and printed captions annoys those who can hear parts of the audiotrack and/or lipread.

(3) There is not now - - and may never be - - a routine formula for producing captions. Every TV program brings new challenges and alternative solutions. Caption-production - - when accomplished efficiently and effectively - - is a professional art requiring not only specific basic skills and understandings but also constant vigilance, ingenuity, and creativity. It cannot in the foreseeable future become a static procedure to be approached routinely. It must, however, be undertaken with one cardinal commandment in mind: "Thou shalt not editorialize." Caption-production requires above all else professional editing skill.

I stress these points because the day is dawning when more and more television programs will carry closed captions. Would-be captioners will spring up everywhere. It's a new profession in the broadcasting world. Unless these people are properly trained, the results will be at best inept and at worst disastrous with valuable learning opportunities ill-used. Hearing-impaired people themselves are presently so grateful that they'll accept shoddy captioning without question and, if severely or profoundly deaf, they may not even know the difference. But we hearing professionals who devote our lives to serving them must protect them. We must stand up for

their rights. BEH leaders, too, recognize the potential pitfalls, and it now seems likely that formal qualifications and training programs will be established for television caption-producers.

We've come a long way in a relatively short time. It was just about six years ago when new technology offered a glimmer of hope for making television accessible to hearing-impaired Americans. Today, the future looks bright. A total closed-caption production and transmission system is in its final stages of completion. The critical FCC rulemaking has been achieved. The final steps are being attacked.

Even on the commercial front, the outlook for closed captioning is not completely bleak. As recently as two months ago (Jan. 11, 1977), a major article in the Los Angeles Times entitled "Closed Captions: PBS Pioneers TV for the Deaf" contained this heartening information:

> "One enthusiastic backer of the PBS system is TAT Communications, Norman Lear's production company. Virginia Carter, Vice President for public affairs, explained that they became sensitive to the problems of the deaf after doing an episode on the subject for Good Times last season.
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> "Hearing about PBS' work, they had Mrs. Caldwell caption the episode for them after it had aired so they could see how it works. 'It's a wonderful system,' Ms. Carter says now. 'Doris proved to us you can caption and retain the humor and the essence of the show. . . .'
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> "Ms. Carter said her company-which also makes All in the Family, The Jeffersons, Mary Hartman, Maude, All's Fair and One Day at a Time - will be talking with other producers, the networks and civic organizations to find a means of sharing the cost of captioning when the decoders hit the market.

"'I think there are enough responsible decision-makers in this community to share that load,' she says. 'It's just all so sensible that I can't believe we won't find a way to do it.'"

With commercial television's top producer already on our side and the same supportive groundswell which proved so effective before the FCC now ready to surge again, it seems certain that the world of television will indeed be opened to hearing-impaired Americans before the end of this decade. Thank you.

DC/jmo