

It might come as a surprise to most, but you'll probably be paying for something extra with your next TV purchase: a caption display. "But wait," you might say, "TV captioning is for the hard of hearing. I'm not deaf, and nobody in my household is, either. Why should I pay for a feature I'm not likely to use?" Because Congress says so according to the "Television Decoder Circuitry Act of 1990," that's why.

However, there are also more acceptable reasons for making the feature requisite. For example, don't be too sure that no one in your household needs captions to follow the action. The National Captioning Institute, which admittedly developed the technology, estimates that 20% of the population suffers from hearing impairments significant enough to derive benefit from the captions, and they're not all senior citizens.

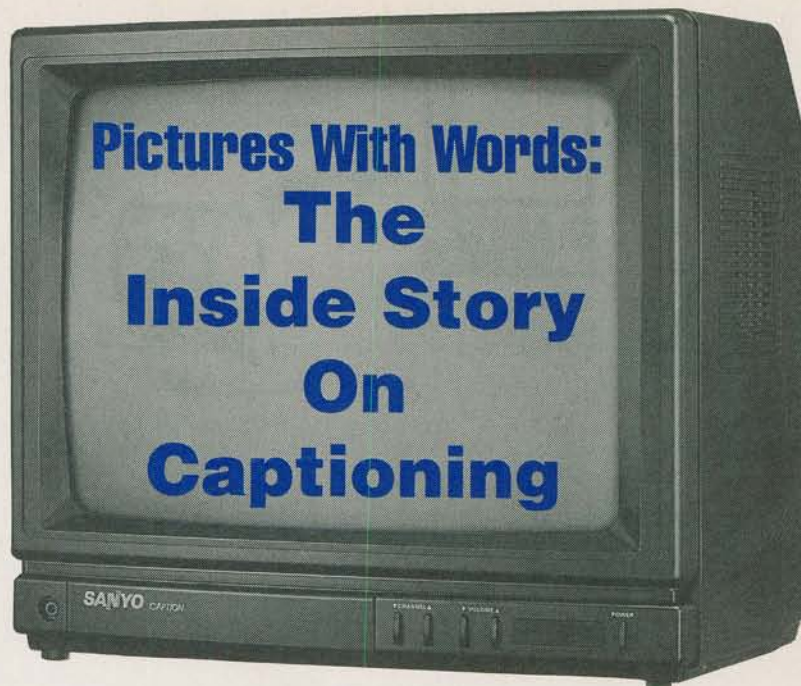
Besides, says the NCI, you don't have to be deaf to enjoy its benefits. Since the captions (which appear at the bottom of the screen when a TV's caption circuit is active) generally match any program's dialogue, it's a great way to teach kids to read. Since it will allow immigrant viewers to compare spoken words with their printed form, it'll also be useful for learning to read English.

Also, if the phone rings just as the TV drama you're watching reaches its climax, just hit the mute and caption buttons on your remote. Then occasionally read the text while you converse on the phone (provided the conversation or the program is not too engrossing). When you hang up and turn the audio back on, you won't have missed any of the plot.

Even so, not everybody wants to see two lines of text at the bottom of his or her television picture, which is why captioning is switchable; it's there if you want it, not if you don't.

Captions Grow Up. Captioning has actually been available to a limited extent for the past 13 years (a similar system used extensively in Europe is even older). PBS has been particularly active in providing captions for most of its network offerings and virtually all of its shows for children already.

While there's a fair amount of captioning going on, the use of text is still in its infancy. In Europe, it displays train



New TV receivers with a screen sizes of 13 inches or larger will include an additional feature: a caption-display mode.

BY ROBERT N. ANGUS

and plane arrivals and departures, what's playing at the cinema, news headlines and stock tables. Here it's used mainly by ABC Network affiliates to advertise upcoming programs. However, just as soon as somebody figures out how to make the system pay for itself, those black boxes will fill up with information that's available whenever you want it.

However, for a variety of reasons, decoder purchases were generally limited to senior-citizens' centers and the homes of the profoundly deaf. For one, the price of add-on decoders was about \$250. Fortunately for those that need captions, experts realized that the cost of decoders could be dramatically reduced if they could be produced in huge volume (*i.e.*, if they were mandatory). Also, the additional expense of the custom integrated circuits required to handle captions could be lessened if they're designed to perform some of the conventional chores of a television circuit as well.

Exactly how much the feature is likely to cost was still a matter of conjecture at the time this was written, with some manufacturers saying the price would be zero and others put-

ting it in the range of \$5 to \$20, depending on the screen size and sophistication of the set. Since all manufacturers are subject to the TV Decoder Act, whatever the increase is it will be pretty uniform across competing models. Furthermore, because of the intense competition among manufacturers and retailers for set sales, it's very likely that one or both will absorb any increase in price.

Up to now, many whose hearing is merely impaired have stayed out of the decoder market because of the large and ungainly appearance of the units. Since the new caption decoder doesn't advertise its owner's problem (being built right into the TV), it might be a hit with such individuals.

Not all TV programming is or will be captioned, but NCI spokesperson Don Thieme estimates that virtually all prime-time network programs, feature films, syndicated programs, evening newscasts (and many local-TV newscasts) are, and more are being added all the time. "In addition," he explains, "once a program or movie is captioned, the information remains, for whatever form that program takes." That means that the vast ma-

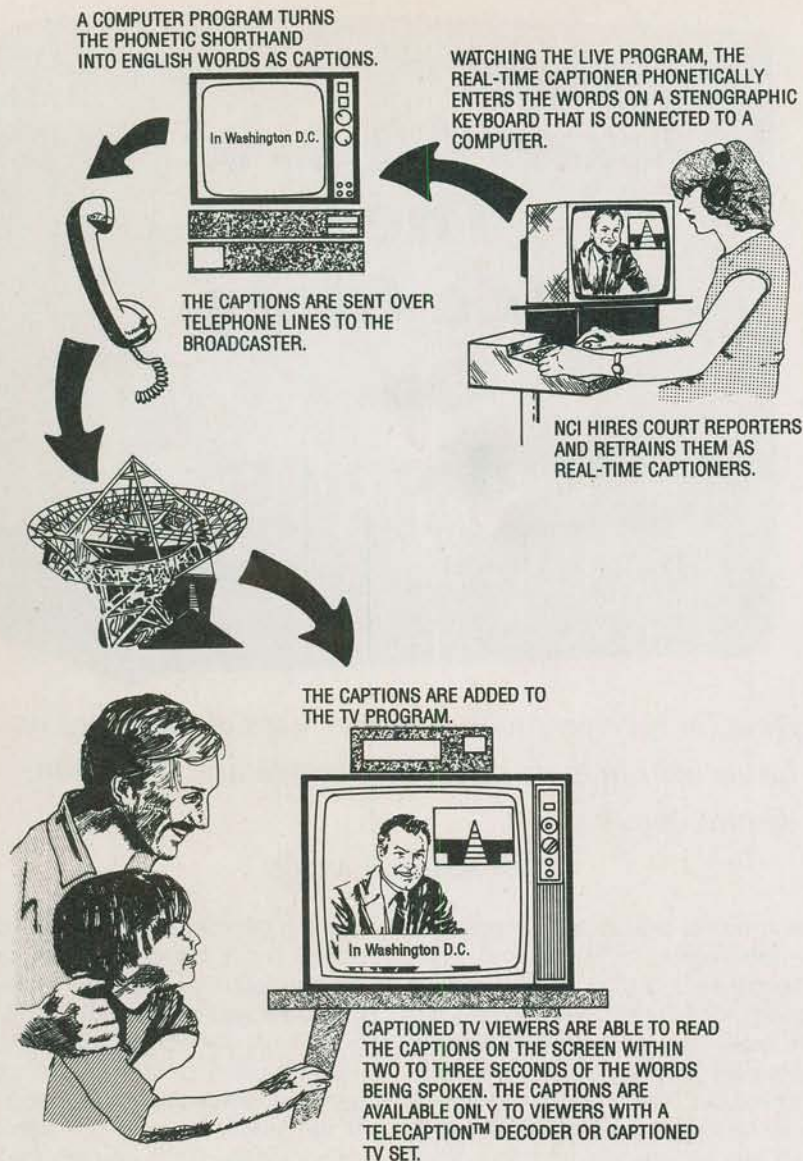


Fig. 1. In real-time captioning a specially trained steno-typist enters the text, which is combined with the program by the broadcaster before being sent to your home.

majority of video rentals (whether disc or tape), over-the-air broadcasts, cable programming, and satellite transmissions will all contain captions.

How They're Produced. Captions are inserted as data within scan line 21 of the vertical-blanking interval—the black line that appears to separate one video frame from the next when the picture accidentally rolls. On a current TV the caption information would appear as a series of monochrome dashes within the black band. In the TV's soon-to-come, a silicon chip will detect the data, decode it, and display the information as lines of text (up to two) at the bot-

tom of the TV picture when enabled.

Of course, the captions must first be encoded into the picture information. In the case of live programming, like sports events or newscasts, the captions are produced at the time of broadcast (see Fig. 1). That requires a court reporter able to transcribe up to 250 words per minute and specially trained for the accuracy and skills necessary to do real-time captioning. The reporter watches and listens to the live program while steno-typing the words that are being spoken. The keystrokes are fed to a computer that translates them into captions that can be transmitted simultaneously along with the TV program. So the captions

appear within two to three seconds of the words having been spoken.

In the case of prerecorded material (feature films, syndicated shows, and the like), the producer sends a videocassette copy of the program to a captioning center where a trained captioner listens to the program dialogue, then types the captions making sure that the words appear *in sync* with the audio. The captioner also indicates important sound effects and places musical notes around song lyrics. He then sends a computer diskette containing all of the caption information back to the production company or studio, where it's merged with the master tape to create a captioned submaster tape—a process called encoding.

In Operation. Thanks to the use of compression techniques, there are no less than four caption modes in the system, to allow for languages in addition to English and for future growth, although generally only one is used now. In addition to the four caption modes, which permit the display of two lines of data at the bottom of the picture, there are four text-mode fields as well, all of them housed on line 21. The text occupies a somewhat large block in the center of the TV picture and allows the display of late ball scores, tomorrow's weather, the rest of the evening's TV schedule on that channel, or whatever the broadcaster chooses to put there.

To use the caption feature, most viewers would simply press a caption on/off button on their handheld remote-control once the set is turned on. The caption mode appears as text in the upper right corner of the screen (either "C1 F1," "C1 F2," "C2 F1," or "C2 F2"). You then select a mode and wait for the text to appear. The scanning system is not instantaneous, so it may take a few seconds for text to become visible even on a fully captioned program. An average wait for a fully captioned program may be six to eight seconds.

Just as not all television programs are captioned, not all parts of captioned programs contain text. For example: live interviews in local newscasts or color commentary at sports events. Thus, even though you're watching a program advertised as

(Continued on page 96)

CAPTIONING

(Continued from page 54)

captioned in the proper mode, you may not see text even when someone is talking, or what you hear may not precisely match what you see. That doesn't mean that the TV set or system isn't working properly.

How Can TV Teach Kids to Read?

Some families make a game out of reading the captions, particularly with shows like Mr. Rogers and Sesame Street (both early converts to captioning). Dad or Mom turns down the audio volume and assumes the role of the narrator or central figure. The small fry read the lines spoken by the other characters. Or, with the audio turned up, a parent may point to a new word in the caption as it's spoken on the screen. "Reading a favorite television program can be both an enjoyable and educational family activity," says Gary Shapiro, Vice President of the Consumer Electronics Group of the Electronics Industries Association.

If all of this sounds pretty good to you, but you don't feel like investing in a new TV set to get it, you can buy a small and attractive add-on adapter made by NCI (5203 Leesburg Pike, Falls Church, VA 22041) that offers some features not found on built-ins. The TeleCaption 4000, at \$180, features a built-in tuner, the ability to record captions on videotape, and portability. The TeleCaption VR-100 at \$130 is virtually identical in appearance and features, but requires the use of an external TV tuner. ■