

## Closed Captions for DTV

Captioning for television began in the 1970's. Initially it was "open captioning" where the captions were always displayed on the consumer's TV from a video keyer at the TV station. This wasn't well received by the hearing public who had viewed this so a means of providing a way of turning the on-screen captioning on and off needed to be developed. This was soon developed and a method of adding the captioning data information to an unseen portion of the vertical interval of the NTSC television signal for distribution was adopted. Line 21 was chosen and in 1976 closed captioning was approved by the FCC.

Closed captioning of TV programming slowly gained acceptance throughout the 1980's. The Public Television Service (PBS) was instrumental in making closed captions a regular feature in TV programming. By the mid 80's the networks were all on board providing captioning for most pre-produced programming.

Closed captioning initially used both fields of Line 21 in the NTSC signal. Later a new set of data services called the "Extended Data Services" (XDS) came along and occupied Field 2 of Line 21, closed captioning now resides on Field 1 of Line 21. XDS was developed to deliver more information to the consumer TV. It often is used to convey the station call letters, channel number, network affiliation, and "V" chip information. PBS was the first to use XDS as they worked with Sony to develop a method of synchronizing consumer VCR time clocks to the broadcast station clock. This was done to improve accuracy for consumers when they would do a time delay recording on their home VCR.

Line 21 captions for standard definition digital video are often referred to as "EIA-608" or "CEA-608" captions (EIA is the Electronic Industries Alliance; CEA is the Consumer Electronic Association). Line 21 or 608 captions provides up to four caption services per program and a limited visual display of the caption information. Usually it is just a black screen box that pops up with white text that generally scrolls vertically.

With the development of digital TV an enhanced method of carrying and displaying closed captioning information was developed. Known as EIA or CEA 708 captions this new system provides up to 10 times more data payload than 608 captions. It provides more available languages and a customizable, color display for the end user. It is carried in the Vertical Ancillary Data (VANC) portion of SMPTE 259 (SD) and SMPTE 292 (HD) video signals and is defined in the SMPTE 334M VANC specification.

For over the air digital broadcast it is required to provide both 608 and 708 captions for SD digital channels and 708 captions for HD channels. Many stations have not addressed the 708 captions on their SD channels and they need to. Newer broadcast encoders have the capability of taking SD video signals and translating the 608 captions to 708. Older encoders require this to be done externally. Companies like Evertz, Norpak and Link Electronics offer translation equipment.

It is interesting to note that all consumer DTV receivers with analog outputs must provide line 21, 608 captions. The thought here is that this signal will be displayed on older NTSC TV's and it is necessary to provide caption viewing capabilities on those sets.

As of January 1, 2006, nearly all TV programming had to be captioned. This includes live news shows and sport events. There are many companies that provide captioning services and ROSCOR Corporation can assist you in the caption encoding/decoding/translation hardware. Real time captioning that requires accuracy is still a manual process with a trained caption entry person. Voice recognition caption software systems work but due to differences in human voice and speech patterns they can't offer the same level of reliability and accuracy, yet. This technology keeps improving.

Contact your ROSCOR sales associate to discuss how your station can become DTV Caption compliant.