grass valley
A **BELDEN** BRAND

How To Maximize The Power of Your K2 System with Closed Captioning & Teletext Support
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APPLICATION NOTE
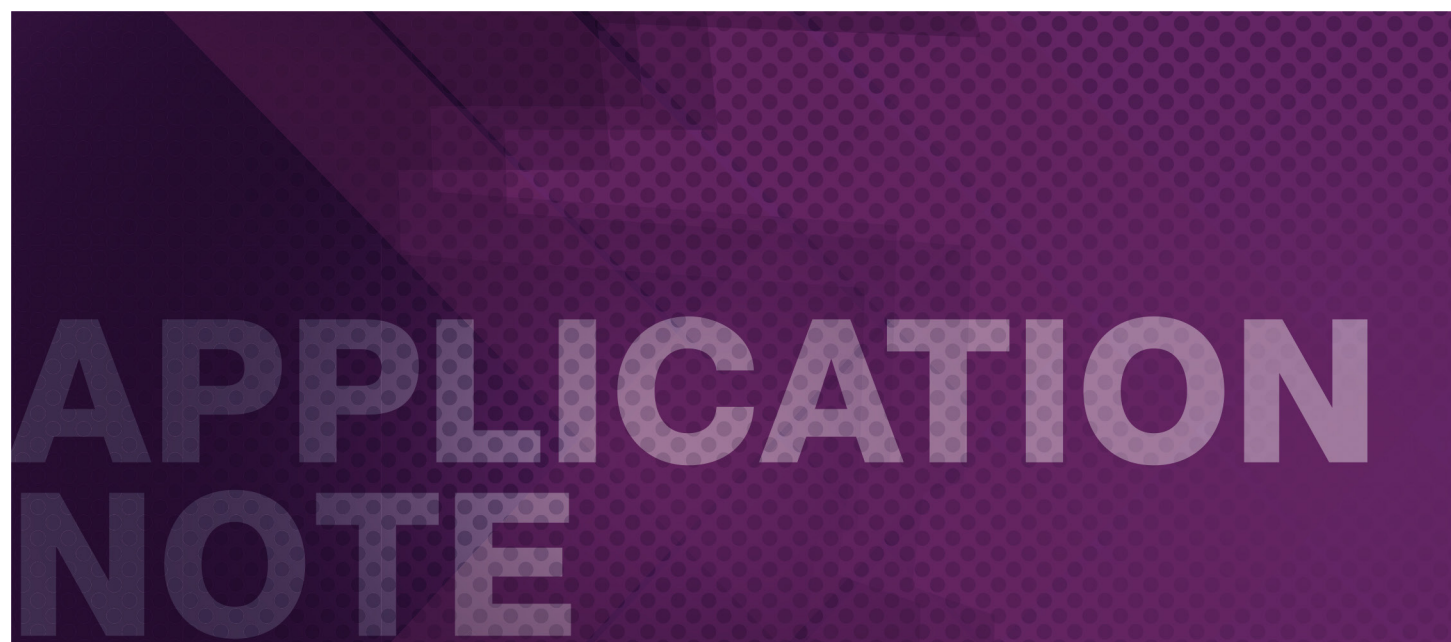
Support for captioning is often done downstream of the storage device and in many cases, added in real time. For content that already contains captioning information, the process to edit or add new captions (such as censorship or adding other languages) is difficult. Many NLEs throw away captioning during the editing process and thus the whole file needs to be re-captioned after the edit. K2 servers from Grass Valley, a Belden Brand, solve this problem.

K2 Solutions

With the K2 server system, there are a variety of options to simplify this task. Below are four examples.

1) An hour long program is ingested (as video or file) and needs to be played back with local spots inserted.

2) A program needs extensive edits to remove objectionable material – video scenes cut and language replaced.

3) A news telecast needs captioning added from an existing script from the NRCS.

4) Captions for a second language are added.

Example 1

A single long form program with captioning needs to be split into individual segments for local insertion.

Solution 1a – With many automation systems, no editing is required. Knowing the timecode of the breaks, automation plays the original file between the appropriate timecodes, then switches to another source or plays another clip for the commercial and then back to the original file with the next set of timecodes.

Solution 1b – Using the standard K2 AppCenter's built in cuts edit capability, each segment (Seg 1 – Seg 6) becomes a subclip (Figure 1). A K2 subclip is simply pointers to the original content. Thus each segment is a small EDL – it does not duplicate content thereby saving significant disk space. Each segment would be loaded into a playlist with the appropriate spots played between the segments. K2 also has the capability to erase the parts of the original file that are no longer being referenced. You can also transfer the subclips to another K2 in which case, they become a standalone file.

Single Ingested file with inserted spots or holes

AppCenter cuts the files into 6 files (subclips) while preserving the existing captioning
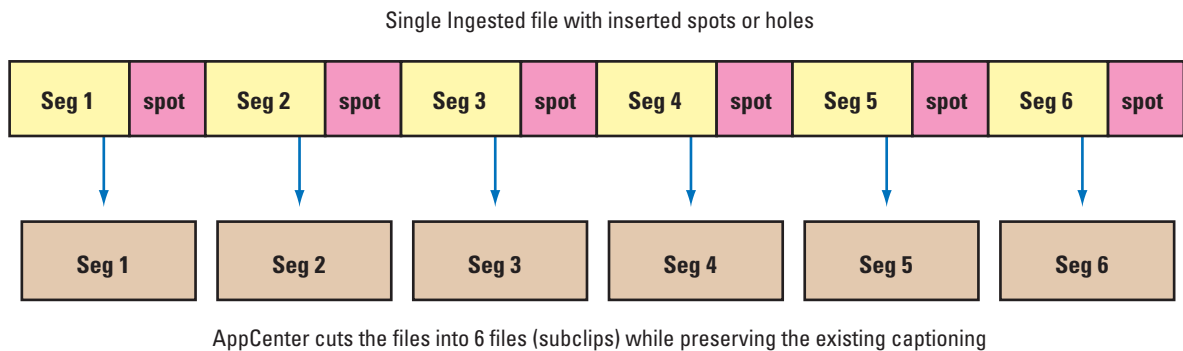
Figure 1 – The original long form clip is divided into individual segments, cutting out the commercials or blank areas. The resulting files are just pointers to the original content – material is not duplicated.

K2 Solutions (Cont.)

Example 2

A program needs extensive edits to remove objectionable material – video scenes cut and language replaced.

Solution 2 – The main issue with this example is that many NLEs will throw away the captioning information when it is loaded onto the editing timeline. With the K2 server approach and K2 AppCenter Pro, only the areas around the edit need be re-captioned.

1) A third-party Captions Editor extracts the existing captions from the K2 to be used after the NLE edits the original video and audio.

2) Edit the file in the NLE as needed, cutting scenes, changing audio, etc.

3) Starting with the existing captions and the edited video file, the Captions Editor can easily inset/cut/change the original captions only in the areas that were edited. Thus saving considerable time and money over re-captioning the entire file.

4) Send the new captions file back to the K2 to replace the original captions in the file.

Example 3

A newscast needs captioning before going to air but there is minimal lead time available. Captions need to be added as quickly as possible.

Solution 3 – The news script is available in the NRCS. With Aurora Edit and K2, the script text and a proxy version of the show can be sent to the Captions Editor with one keystroke. This process can work with content that already has captions or without any captions. After the edit, Aurora Edit sends the script text and a low-resolution proxy version to the Captions Editor. With the text and the proxy, the Captions Editor can easily copy and paste the captions from the text file while viewing the proxy to ensure proper alignment.
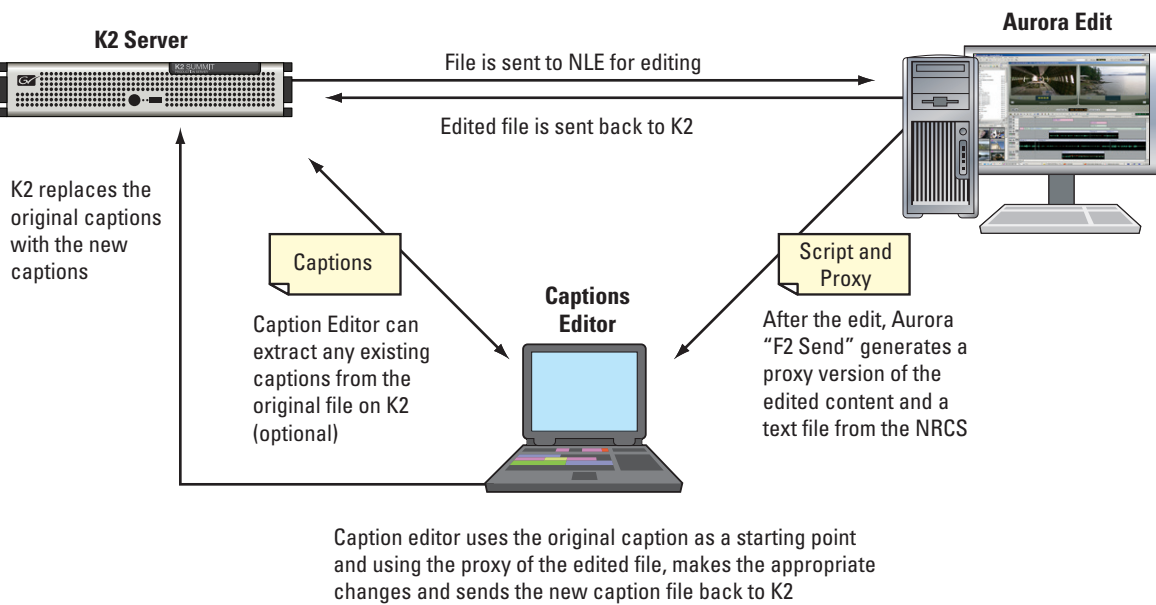
K2 Server   File is sent to NLE for editing   **Aurora Edit**

Edited file is sent back to K2

K2 replaces the original captions with the new captions

Captions

Caption Editor can extract any existing captions from the original file on K2 (optional)

Captions Editor

Script and Proxy

After the edit, Aurora "F2 Send" generates a proxy version of the edited content and a text file from the NRCS

Caption editor uses the original caption as a starting point and using the proxy of the edited file, makes the appropriate changes and sends the new caption file back to K2

Figure 2 – A detailed news workflow with automatic generation of a proxy and script for the Captions Editor.

Note: In all cases, the video files for doing closed captions do not have to actually be transferred.

K2 Solutions (Cont.)

Example 4

A second language is added to an existing file.

Solution 4 – The original language captions are extracted from K2 into the third-party Captions Editor. Using those captions as a basis, a second language is generated and then sent back to the K2 to be added to the original file (Figures 3 & 4).

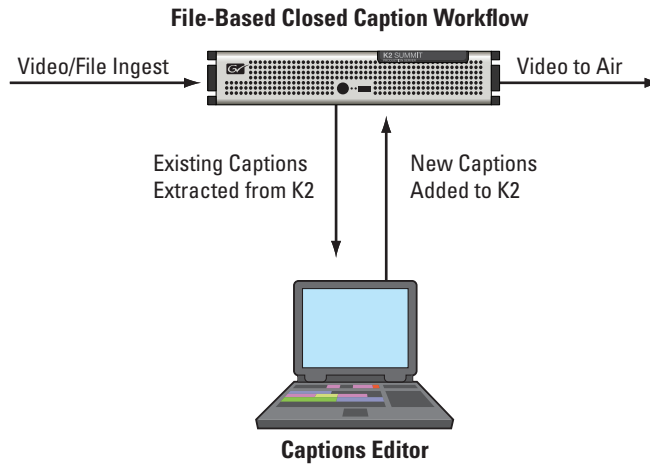**File-Based Closed Caption Workflow**

Figure 3 – Simple view of the captions editing process.

Technical Details

K2 stores all caption data (closed captions or Teletext) as digital data. If closed captions or Teletext are in the VBI, K2 will demodulate it and save it as data. On playout, it will re-modulate it and insert it in the appropriate VBI line for SD or as Anc Data for HD and SD as desired. Note: for this process, the K2 needs to be configured to enable the data track (off by default). With the data track enabled, closed-captions will be stored automatically. Teletext lines must be selected to store the data in digital form.

When upconverting from SD to HD, the 608 (SD) closed captioning is encapuslated in a 708 (HD) packet. CC data that is compressed (picture data) is not translated. Downstream modulators are responsible for translating the 608 data into 708 data.

Caption Editors extract the original digital caption data from K2 and, after editing, sends it back to K2 to replace, merge or add to the edited clip. Other methods require the entire video file to be transferred which is extremely time consuming.

Caption text