EEG's Caption Legalizer

The software is designed to fix HD captioning problems in file-based workflows.

BY PHILIP MCLAUGHLIN

File-based workflows are becoming increasingly efficient and refined in broadcast and video distribution plants, providing these facilities with all of the editing, storage and playout advantages inherent in working with data, as opposed to tape. When it comes to the closed-captioning aspect of providing programming for video on demand (VOD) however, many complexities remain: Video assets such as movies and TV episodes are ingested from a variety of sources, and can be mired with inaccurate, incomplete or otherwise faulty captioning due to a wide range of possible causes. When consumers are affected by these shortfalls, they may register a complaint that can be time-consuming and costly to resolve.

To minimize these occurrences, it is crucial to have an efficient and effective QC system in place for closed captioning. A well-designed QC system will detect problems in the CEA-608 and CEA-708 (HD) caption data, as well as compliance with caption packing requirements specific to ATSC and CableLabs delivery standards.

Full manual screening is a time-consuming and costly bottleneck, and most manual screening procedures are only set up to detect a few types of problems. Even some instances of targeted problems may get by the operator. An improved approach that pairs with screening to greatly enhance QC effectiveness is an automated system such as EEG's MPEG-2 Caption Legalizer, which is software designed specifically to fix HD captioning issues in file-based workflows. Manual screening is then required only to detect issues with the transcription itself, such as correct time sync, while HD/SD matching, delivery standards compliance and decoder compatibility
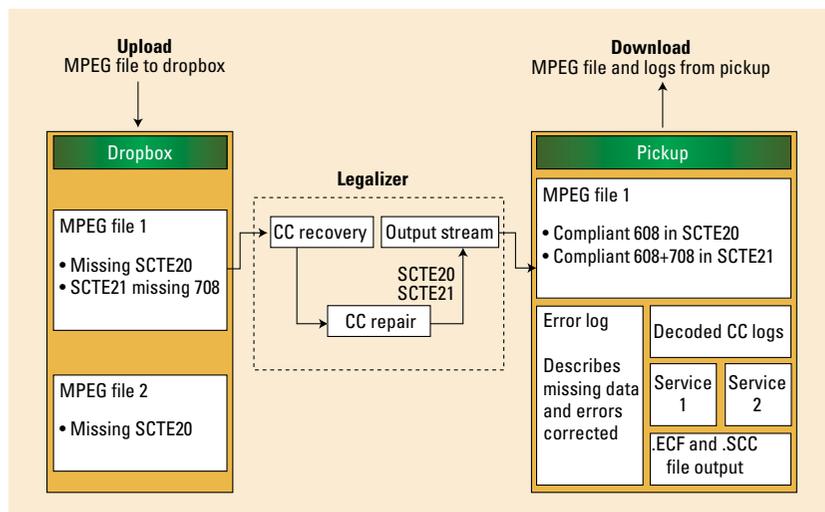

Figure 1. The EEG MPEG-2 Caption Legalizer's role includes fixing improperly constructed CEA-708 packets, normalizing caption window types that cause problems on many consumer decoders, solving problems with mismatched 608 and 708 captions, and other errors.

issues can be detected and resolved automatically.

Inserted into the workflow tool chain, a software-based legalizer allows video distributors to rapidly standardize each file on ingest at up to 15 times real time and efficiently fulfill captioning requirements for VOD or future archival playout.

Before the MPEG-2 Caption Legalizer was made available, there was no equivalent solution for efficient troubleshooting and fixes of captioning issues in the file-based realm. Instead, entire libraries would need to be run through a baseband caption legalizer, or even recaptioned, if they

exhibited basic compliance problems. The role of an MPEG-2 Caption Legalizer is to perform, without generation loss, the tasks that an SDI legalizer such as EEG's CB512, handles in baseband installations, including fixing improperly constructed CEA-708 packets, normalizing caption window types that cause problems on many consumer decoders, solving problems with mismatched 608 and 708 captions, and resolving issues with inappropriate numbers of caption packets or incorrect placement of packets in the video frames.

In addition, the legalizer also addresses new issues specific to MPEG-2

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workflows. These include noncompliant use of the SCTE-20 or SCTE-21 constructs, and matching problems between CEA-608 V-Chip data and MPEG content advisory metadata. More general problems with the MPEG stream are also fixed in a data-preserving remultiplex. This is important because insertion of any additional essence or metadata, including captioning, can affect the timing of the entire MPEG stream. Any tool modifying data in the compressed stream must be fully fluent in these rules, examining PCR data to create an accurate fixed-rate stream matching the desired ATSC profile; given a compliant or even "near-compliant" input, the EEG Caption Legalizer will always produce an output stream fully compliant with the CableLabs and
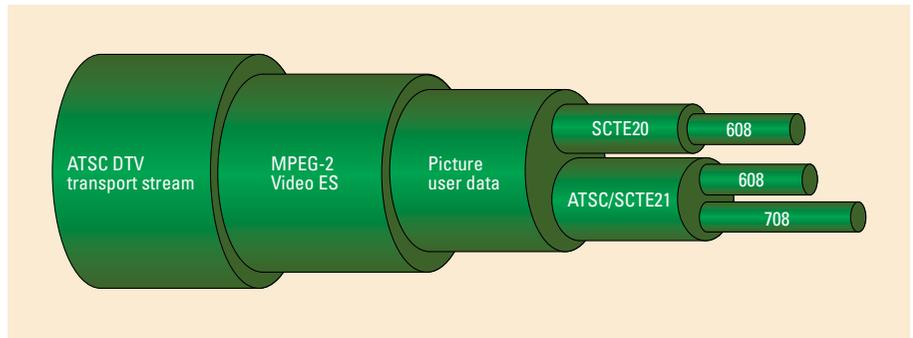

Figure 2. This diagram shows the location of closed-caption data within the ATSC transport stream hierarchy.

15 times real-time capability, the legalizer can process a feature-length HD movie in 10 minutes or a TV episode in two minutes. For distributors who need to control caption quality on thousands of archived shows prior

at ever-higher levels of sophistication, it is essential that captioning not stand out as a bottleneck. For providers of VOD who must QC and distribute a growing supply of valuable content daily, a system designed to eliminate as many captioning bugs as possible is critical for saving time, money and manpower. By inserting the EEG MPEG-2 Caption Legalizer into the signal path, video distributors have a tool designed specifically to ease the captioning difficulties commonly associated with today's systems. **BE**

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ATSC A/53 specifications.

Interface to the legalizer is handled through an FTP dropbox. The advantages of FTP are that it tends to be easily scriptable and universally supported on both specialized video servers and general purpose computer workstations. The dropbox is monitored for new transfers, and files are processed in a queue and output to a designated FTP pickup box. With

to monetizing via VOD, this time savings compared to real-time processing can be key, and even more so when the only alternative would be out-of-house recaptioning. The accelerated processing time also means that a single caption legalizer server can often handle the throughput of even large distributors who ingest many hours of new programming daily.

With file-based workflows moving