

November 1, 2010



TV TechCheck



The Weekly NAB Newsletter for Television Broadcast Engineers

Video Accessibility Act and ATSC Standards

The President signed the “Twenty-First Century Communications and Video Accessibility Act of 2010” (“ACT”) on October 8, 2010. The Act, among other things, requires the FCC to reinstate its prior Video Description Rules not later than one year after enactment of the Act (or approximately October 8, 2011). These FCC rules were originally adopted in 2000 but were vacated by a court in 2002 on grounds that the FCC exceeded its authority. Those rules required TV stations affiliated with the big 4 networks (ABC, CBS, Fox, NBC) in the top 25 DMAs (and the top 5 cable networks nationwide) to provide 50 hours per quarter (approximately 4 hours per week) of video described programming. The Act also gives the FCC the authority to expand, over time (more than a ten year period), the number of hours and the number of markets in which video descriptions must be provided (see the October 11, 2010 issue of *TV TechCheck*).

The technical provisions in the ATSC Standards to deliver a Video Description audio stream can be confusing. While the current versions of ATSC A/53 referenced in the FCC rules enable the transport and signaling of this stream, the newer versions of A/53 are clearer.

The first point of potential confusion is that the audio stream originally intended to be used for Video Description is labeled by the AC3 standard (A/52) as Visually Impaired (VI). The standards describe this as an associated service, that is, one that the receiver was intended to use (or mix) together with the main audio. This “assembly-of-parts” concept dating from the system selection days simply is no longer applicable; and no known ATSC receiver has the two AC-3 decoders that would be needed to enable it. From a production perspective, experts assert that Video Description audio is a separately produced complete audio track with all parts present including the descriptive narration interleaved with the standard dialogue and effects.

Over the past couple of years the ATSC Standards have been updated to reflect this production and receiver reality, and while the label “associated service” is retained, A/53 Part 5 now requires that associated services contain complete program mixes containing all audio program elements (dialogue, music, effects, etc.) that are intended to be presented to a listener. This is signaled by setting the `full_svc` bit in the `AC-3_audio_stream_descriptor()` to a value of “1.”

ATSC is in the process of revising A/52 to clearly be consistent with this new wording; but there is nothing preventing setting the `full_svc` bit to “1” in the current A/52 in the FCC rules.

The version of A/53 referenced in the FCC rules requires that there must be at least one Complete Main (CM) audio (unless there is no audio at all). This is the case for new versions of A/53 as well.

For real time transmission of a separate VI audio in an ATSC Transport Stream, a separate AC-3 encoder would be needed. That encoder would embed the metadata element ‘`bsmod`’ with the value of “010” in the VI audio. Another AC-3 encoder provides the required Complete Main stream with `bsmod`=“000” embedded. The Program Map Table would contain the PID values for the packets that deliver the three elementary streams (video, CM, VI).

The Program Map Table (PMT) is also required to have an AC-3 Descriptor associated with each audio stream. More precisely, an AC-3 Audio Descriptor shall be included in the descriptor loop immediately following the `ES_info_length` field in the `TS_program_map_section()` describing that Elementary Stream. This descriptor contains a corresponding `bsmod` field to signal the type of audio service to the receivers. The CM-associated descriptor has `bsmod` = “000” and the VI-associated descriptor has `bsmod` = “010”, both need to have the `full_svc` bit set to “1.” The CM audio’s descriptor should have the descriptor field *priority* set to “01”, so that cable head-end equipment selects that as the main audio if an NTSC signal is being generated. Setting the priority field to “10” is recommended to signal the audio is intended to be the logical replacement for the SAP channel when NTSC is generated from the digital signal (See A/79). However, use of that value is

not required and the priority field could be set to "other audio" = "10" or "not specified" = "11", which might be the case where a second language service is being sent which is intended for the SAP channel.

The AC-3 descriptors in the EITs (for each event) are constructed in the same manner as the ones in the PMT, enabling digital recorders to offer the same choices to consumers before the recording session.

Receivers should be able to use the AC-3 descriptor from either the PMT or the EIT to inform consumers that a VI audio is available, and then to select it for decoding.

In the event the only audio that is available is a track that contains Video Description, then it would have to be labeled as a Complete Main service in the bsmod fields. It could not have its codes set to signal it was actually Video Description (VI). As there would be only one audio, receivers would be expected to render it independent of this slight disconnect in signaling.

Note that the language of the VI track can be the same as, or different from, the language of the Complete Main, as that may be set independently.

Based on conversations with Dolby about the test process for AC-3 decoders, receivers should be able to decode streams independent of the value of the bsmod field, although selection of specific tracks using bsmod is not part of the testing, so there is no assurance that all receivers can locate and select this particular track.

CEA is in the final stages of developing a recommended practice (CEB21) to provide guidance on selection of streams based on this and other metadata about the audio streams.

REMINDER

Don't forget to check to see if your PSIP generator is sending the correct data. A month before the change in daylight savings time (November 7 this year), it is required to send specific data in the STT. Right now, the DS_day_of_month field must contain the value 7, and the DS_hour field must contain the time when the stations will switch (officially 2, but some stations may transition at a different time). The DS_status bit must be "1" indicating it is still daylight saving time.

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