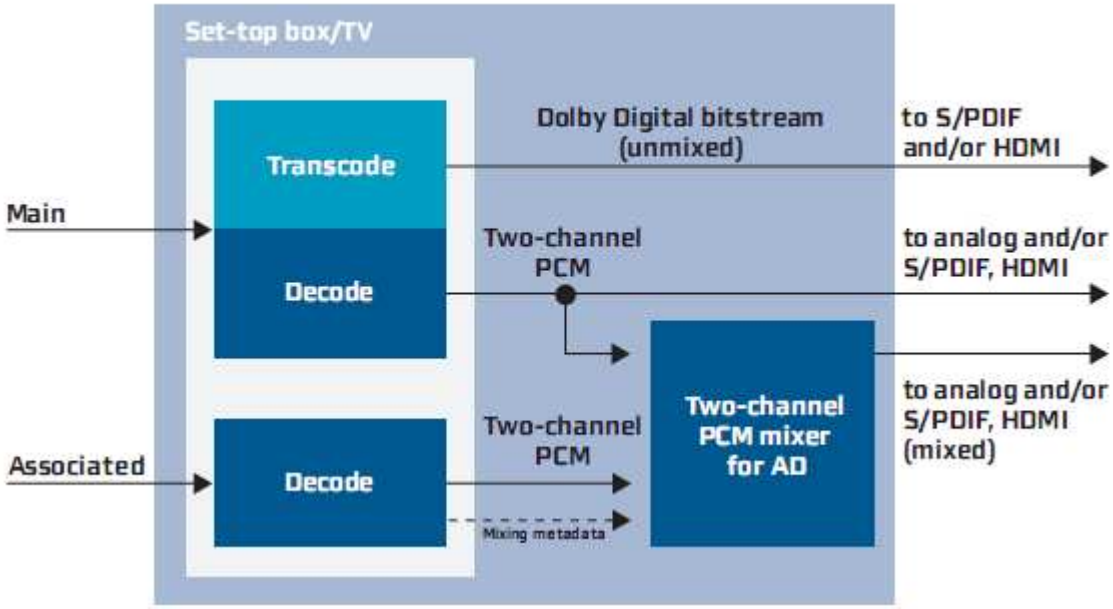
Dolby MS10 Dual Decoder Converter (DDC)

The basic design of Dolby DDC is based on dual decoding support using DDPlus, and transcoding of the primary stream. The design incorporates stereo PCM O/P and transcoded Primary as 5.1 Channel DD thru SPDIF. The following figure is an illustration of this:-



As can be seen, the associated (secondary) stream is completely optional and may be used for Director's Commentary/Audio Description. This stream would also have mixing metadata including Channel Gains and Panning coefficients for secondary (if secondary is Mono). Basically these primary and secondary streams are Independent sub-streams of DDPlus which may have one or more dependent streams to support up-to 7.1 channels on each I/P.

Current implementation of DDPlus in AudioFW incorporates only decoding the first independent sub-stream only.

As can be seen, this design can be easily implemented in STAUDLX using a dual decoder + Mixer chain. There are some changes that would however be difficult in the way STAUDLX system emulates the MS10 DDC. These are mentioned below:-

1. **Input Parsing:** The MS10 specifies that the associated stream may be delivered in the same bit stream as the Main or as in a separate MPEG PES. Currently STAUDLX needs two distinct PES for Primary and Secondary I/Ps.

2. **Error Handling:** The DDC as in the case of DEC71 has various error cases arising if an error occurs to one of the streams (Main/Associated). The DDC basically needs to maintain a history of previous successful decoding so that any error in future can be properly concealed. This involves identifying a Program Change on Error Frame. If only STAUDLX based design is used, maintaining a history wouldn't be possible as the two decoders wouldn't be aware of each other.

Considering these two concerns a modification to the design would be to incorporate the DDC layer wrapper over DDPlus into a new flavour of DDPlus decoder. This way the driver may provide I/P in a single Data buffer or different scatter pages. The DDC layer instantiates a dual decoder if second Independent sub-stream is found, else a single decoding is done. The O/P of the two may be mixed inside the decoder or the O/P of the secondary can be filled up in the AUXILLARY buffer. In all cases the O/P of the final system is restricted to 2/0, so this mixing if done inside the decoder would be easier w.r.t applying the mixing metadata rather than cascading the same to the Mixer Transform.

Major Changes in DDC code w.r.t DDPlus2.1

1. Entire code is in fixed point, the DDPlus2.1 code was floating point for the PCM path.

2. DDC wrapper incorporates the DCV and the DEC51 APIs. So this way a transcoding memory is saved.

3. Dither mechanism is DCV based.

4. Current code does not/may not support 7.1 decoding (Not required for MS10).

5. Some changes in code need to be analyzed (Optimization/Fixed Point changes/Bug Fixes).