



Advanced Television Systems Committee

### LETTER BALLOT

#### (Proposed) Revision of A/53C Annex D incorporating the EVSB Transmission Mode

June 15, 2004

The Technology Group on Distribution (T3) on May 27, 2003 approved the Proposed Standard: Revision of A/53B Annex D incorporating the EVSB Transmission Mode (T3-596r4). Subsequent revisions approved by T3 are incorporated into Proposed Standard Annex D of A/53C (Doc. PS/T3596r3) dated June 10, 2004 that is attached for your consideration.

Please mark your vote and return this ballot form before the four-week deadline of July 13, 2004.

Question 1: Should the (Proposed) Revision of A/53C Annex D incorporating the EVSB Transmission Mode (Doc. PS/T3-596r3) be approved?

Yes

No

Abstain

Question 2: Shall the ATSC President, in consultation with the Chairman of T3-Technology Group on Distribution, be given "editorial privileges" on the approved document referenced above?

Yes

No

Abstain

Member Organization Harmonic Inc.

Signature /s/ J. Patrick Waddell Date 7/12/04

Editorial comments or specific objections:

Please see attached pages

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Please return this ATSC Letter Ballot by July 13, 2004 to the ATSC  
via fax 202-872-9161 or <mailto:ballot@atsc.org>.

Harmonic votes NO, not in opposition to E-VSB, but because this Proposed Standard, in the context of the overall standards required to complete an E-VSB system, is not complete.

Specific comments:

1) Page 1: The document is missing a reference to SMPTE 310M. There are seemingly Normative references to SMPTE 310M in Section 5.2.

2) Page 23 ff: There is no table showing (informatively) the bitrates for any combinations of 1/2 rate, 1/4 rate, and main. Table D5.3 provides step numbers for all of these, but the missing Table D5.3c (which was distributed to T3S9 as Document 195) is missing.

Without this table, users cannot easily understand compliance with new Section 5.6.1.

3) We know, from CS-608 and CS-609, Section 6.1.1 that encoder buffer allocation behavior:

may need to be constructed with constraints on the buffer size of the T-STD as defined in Section 2.4.2 of ISO/IEC 13818-1 [C3] so that the variable time delay caused by the E-VSB system does not result in a violation of the requirement that the TS-R conform per the preceding paragraph.

From this we may infer implications for the multiplexer which exists between the encoder and the E-VSB “Main and Enhanced Mux Packet Processor” shown in Figure D5.2 of the Proposed Standard.

A change of map, such as may be forced to remain compliant with Section 5.6.1, may occur twice or more often a day. Such a map change requires tight coordinated action between the encoder, mux, and the yet to be built E-VSB front-end “demultiplexer.” This demultiplexer is based on Figure C2 from CS-608/CS-609 and is illustrated below:

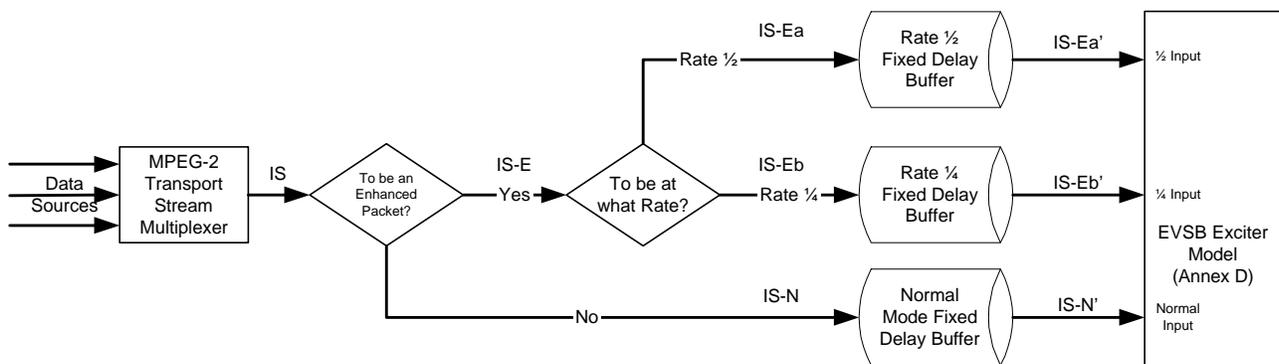


Figure C2 from CS-608 and CS-609

## Harmonic Inc. Comments on ATSC PS/T3-596r3, A/53C Amendment 3

As an illustration, we choose map number 151 (compliant with Section 5.6.1) for “premium programming time” operating mode, where the 1/2 rate stream runs at 1.95 mbps, the 1/4 rate stream runs at 0.11 mbps (for a total of 2.06 mbps). Note that the main stream is left with not 17.322 mbps, but only 14.42 mbps. This leaves CBR bandwidth for only a single HD 1080i service at most (depending upon the compression system used). We assume the operator wishes to keep some enhanced services alive in prime-time.

For the non-“premium programming time” case, we will assume the operator wants to run several enhanced services (using advanced coding) or at least one MPEG-2 service (not as a fallback). So we locate another map number which might provide sufficient bandwidth for a robust service, map 377.

This map number provides for 1/2 rate stream at 4.34 mbps, the 1/4 rate stream at 0.49 mbps, and the main stream is left with only 7.21 mbps. Depending upon the compression system employed, the user may be able to do 2 or 3 SD services in the main stream under this mode.

Note that there are 3 “fixed delay buffers” at the input to the exciter. At the moment of map change (which always must occur at the start of an E-VSB “segment”, (1) the encoder making 1/2 rate audio and video must change (on a TS packet boundary) from 1,951,961.531 bps to 4,337,692 bps, while simultaneously the 1/4 encoder must change from 108,442.307 bps to 487,990 bps, and the main channel encoder must change from 14,420,181.93 bps to 7,210,090.966 bps.

Now note that the sum of the 3 streams NEVER is 19,392,658.46 bps. That rate must be produced ONLY when E-VSB is taken to zero. The actual multiplexer output TS rate will also need to vary at the change of a map, once again on a TS packet boundary...

In the case of map 377, it will be running at 12.035,772 bps (dropping fractions for the moment. For map 151 earlier, it ran at 16,480,586 bps.

What is missing from this Proposed Standard is any method of signaling between the E-VSB “Main and Enhanced Mux Packet Processor,” perhaps the E-VSB Exciter, and the Digital Compression System upstream. Such signaling is necessary to permit the operator to make the type of map change illustrated above.

4) As noted in our Statement which accompanied this Ballot, Harmonic recommends that the E-VSB Proposed Standard be returned to T3S9 for further refinement (as proposed by others at the most recent T3 meeting), and then be elevated by T3 to a Candidate Standard along with its peers for appropriate review and trials.