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Specialists Group on Coding for Visual Telephony

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TITLE : COMMENTS ON ZERO-BYTE REPLACEMENT

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1. Introduction

A zero-byte replacement scheme was proposed at the Red Bank meeting to cope with the network restrictions in North America (Doc. #252). This document presents some comments on this scheme.

2. Protection of flag bits

Since a flag bit is required every 1.25 ms sector for 384 kbit/s transmission (n=1), mean time between flag error (MTBF) against bit error rate is as follows;

Bit Error Rate	Mean Time Between Flag Error
10E(-6)	0.35 hour
10E(-5)	0.035 hour
10E(-4)	0.0035 hour

Once error occurs in a flag bit, one or more octets in the sector may suffer errors assuming every all zero byte is replaced. Comparing these values with those in Fig. 1/Doc. #288 of the companion document, we can say that MTBF is longer enough for the case of without FEC. If we apply FEC, however, MTBF is much shorter than MTBE, or mean time between error due to erroneous video data. Hence some protection of the flag bit is required in this case.

Simple three bit majority decision or application of (16,8) error correction code as used for BAS coding may be a candidate.

3. Flag bit transmission

Flag bit transmission was proposed to be through AC in Doc. #252. Possible conflict in the AC bit assignment was also pointed out at the Red Bank meeting. If we protect the flag bit by adding redundancy, necessary number of flag bits per sector becomes 16-24 for n=1 and 40-60 for n=4. These many bits can not be dealt with in AC.

Another consideration is that these flag bits belong to optional facilities. Some guideline is required on how to deal with these optional facility related information in the AC. It is obvious that the indication and control for usage/non-usage of defined optional facility should be included in the codec-to-codec signalling channel in AC.

An alternative method to transmit the flag bits is to allocate a flag bit plus associated redundant bits at the end of each sector. This solution will contribute to reducing transmission delay but with some hardware complexity.

4. Eighth bit of the replacing code for n=1

Necessary number of bits for the replacing address code is 7 for 384 kbit/s. The 8th bit of the replacing codes is not defined in Doc. #252 if they are not in the first timeslot. The choice may be '1'.

5. Conclusion

Error protection of the flag bits and their position in the frame structure have been discussed. The following alternative is provided for discussion.

- Redundancy is added to the flag in order to protect against transmission bit error.
- Flag bits for each sector are allocated at the end of the sector.