25

CCITT SGXV
Working Party XV/4
Specialists Group on Coding for Visual Telephony

Doc. #421

Source : The Netherlands, BTRL
Title : Status field trials Error Correction hardware H.261 codecs

1 Obtained results

The field trials involved experiments with error correction code hardware for the $n \times 384$ Kb/s codecs according to rec. H.261

DNL and BTRL have defined two code formats: an BCH (255,239) code and an BCH (511,493)[1] code, both capable of correcting two bit errors within one code word. An additional framing bit matches the code word length to the 2 Mbit/s frame structure. Also we have agreed on the position of the error correction parity bits in the 2 Mbit/s frame, as well as the synchronization of coding equipment relative to this frame structure.
Both parties have built and debugged their hardware and all seems to work well, when connected to a H.120 video conferencing codec. So far we have experimented with a H.120 codec that has been down-scaled to 1.5 Mb/s to leave free space in the frame for parity bits. If the H.261 codec becomes available we can therefore quickly test our hardware with it and judge the practical use of the error correction.

October 20th, DNL made a connection with another studio, both sides using H.120 codecs that were supposed to operate at 1.5 Mb/s. The test showed that the down scaling of the codecs caused some problems. Therefore these problems could be solved before the next field trial.

October 24th, there was a trial with H.120 codecs between DNL and BTRL. It was the intention to check the compatability of the BCH hardware, and the proper functioning of the down scaled codecs. Unfortunately there were some problems with the connection so this field trial did not answer the question of compatability.

November 23 th, the connection was established after a few minutes with the H.120 codecs working at 1.5 Mbit and no error correction equipment switched on. There were initially some errors, the picture disappeared from time to time and we

[1]BCH chips sets where provided by Mitsubishi

may conclude that either the codecs didn't work well together with the network when adjusted to 1.5 Mbit or the connection was just not very good. Because the quality of the connection varied during the experiment it will probably be noise that caused the problems.

Because of the noise our results and conclusions must be preliminary; one experiment however involved the BCH 511 encoder and decoder, with a clean picture (no noise was injected), although at BTRL a noisy picture was received, at DNL a good quality picture was received while the decoder status showed many errors. When a few errors were introduced they could not be decoded. As our equipment has shown to work well in a laboratory situation, and in loop back at a national network node, from the above observations we may establish the 2 following (preliminary) hypotheses :

- there may be error messages because the decoder is not well synchronized with the encoder.
- there may be something going on along the transmission path where data is intentionally changed, no unrestrictive digital link.

For the time being both possibilities are investigated.

2 The next field trial will involve the following issues

We will investigate whether a connection can be made between both ground stations and whether the error correction hardware at BTRL and DNL is compatible using error injection at TTL signals. If this test succeeds we will inject errors into the HDB3 signals, to have a more realistic approximation of the real life circumstances. In fact this may turn out very important for the subject of error propagation through the HDB3 interface (does a single error in an HDB3 digit correspond to one bit error or more after decoding the HDB3 signals?). Finally we are planning a Bit Error Rate (B.E.R.)-measurement of the 2 Mbit link with the aid of special equipment for this purpose. This link will not involve error correction hardware, because of practical hardware problems. On the other hand it would not be easy measuring a very low bit error rate, e.g. one bit error in every 3 hours!

3 Future Experiments

We will test the equipment with the $p \times 64$ codecs, p being 6 to 24 inclusive; p = 30 will not be permitted because space is required for error correction bits. Some experiments are planned with encryption combined with error correction.