CCITT SGXV/4
Working Party XV/1
Specialists Group on Coding
for Visual Telephony

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TITLE : RESULTS OF TRIALS ON ERROR TRANSMISSION AT 384 KBIT/S

INTRODUCTION : Error Resilience of the algorithm scheme of the p x 64 kbit/s codec has often been discussed in the last meetings. This paper describes the tests which were performed in JULY 1988 on the flexible hardware. These tests should give preliminary information to the "error correction group".

1 - DESCRIPTION OF THE FIELD TRIAL

Tests are performed with the flexible hardware located in LANNION and with instruments located in CNET (PARIS) connected by a 2 Mbit/s link (500 km using radio links and coaxial cables).

The flexible hardware sends the 384 kbit/s signal towards CNET labs where errors are added before sending back the signal to the receiver. The decoded picture is sent to a video tape recorder.

Proceeding in this way suppose that these are very few errors on the 2 Mbit/s link.

2 - RESULTS OF ERROR MEASUREMENTS ON THE CHANNEL

A random sequence has been sent for more than 20 hours from CNET in order to count the number of transmission errors during the day.

A 2^{19} length sequence was used on the 31 time slots. It can be seen on the results (ANNEX 1) that this link meets G821 RECOMMENDATION and will introduce very little change in the results of error resilience trial.

3 - RESULTS OF TRANSMISSION ERRORS ON THE CODEC

To insert errors in the 2 Mbit/s link a PCM test equipment is used (TEKELEC TE 820). All the time slots are looped in this set except TS2, TS3, TS17, TS18, TS19 which are extracted from the PCM frame and sent on a X24 port. An exclusive OR is used to send errors back to the PCM test equipment via the X24 port.

Two programmable data generators are used to forced error transmissions. The first one gives the period between errors, and the second gives the number of bits.

On the video tape, you can see the results for different cases :

1 error during each period of 1 second
1 error during each period of 0,5 second
1 error " " of 0,2 second
1 error " " of 0,1 second
1 error " " of 0,025 second

8 consecutive errors during each period of 1 second
64 consecutive errors " " " of 1 second

8 consecutive errors during each period of 10 seconds
64 consecutive errors " " " of 10 seconds
512 " " " " " of 10 seconds
4096 " " " " " of 10 seconds

1 error consecutive " " " of 12 seconds : limit of G821

~~8 consecutive errors " " " of 12 seconds : limit of G821~~

4 - CONCLUSION

It seems that the codec scheme has some error resilience. Discussions on error correction should take these results into account.

DEBUT IMPRESSION FICHIER : VISIOF.DO CATALOGUE : /DONNEES/
essais visiophone
REPRISE IMPRESSION

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27/06/1988 16:36:44/763  reprise enregistrement
27/06/1988 16:36:44/000  CR : 0
27/06/1988 16:36:44/001  Debut IDF
27/06/1988 16:36:47/000  SGE IDF: oui  IND: non  TEBs> ------  er: 0
27/06/1988 16:36:48/000  SGE IDF: oui  IND: non  TEBs> ------  er: 0
27/06/1988 16:36:49/000  SGE IDF: oui  IND: non  TEBs> ------  er: 0
27/06/1988 16:36:50/000  SGE IDF: oui  IND: non  TEBs> ------  er: 0
27/06/1988 16:36:51/000  SGE IDF: oui  IND: non  TEBs> ------  er: 0
27/06/1988 16:36:52/000  SGE IDF: oui  IND: non  TEBs> ------  er: 0
27/06/1988 16:36:53/000  SGE IDF: oui  IND: non  TEBs> ------  er: 0
27/06/1988 16:36:54/000  SGE IDF: oui  IND: non  TEBs> ------  er: 0
27/06/1988 16:36:55/000  SGE IDF: oui  IND: non  TEBs> ------  er: 0
27/06/1988 16:36:55/762  Fin IDF
27/06/1988 16:36:56/000  SGE IDF: oui  IND: oui  TEBs> ------  er: 0
27/06/1988 16:37:06/000      IDF: non  IND: non  TEBs> ------  er: 0
27/06/1988 16:47:23/707  seqt: 230          er: 2
27/06/1988 16:47:24/000  SAE IDF: non  IND: non  TEBs> 10ee-7  er: 1
28/06/1988 06:39:21/815  seqt: 3065         er: 2
28/06/1988 06:39:22/000  SAE IDF: non  IND: non  TEBs> 10ee-6  er: 2
28/06/1988 07:05:21/599  seqt: 14185        er: 2
28/06/1988 07:05:22/000  SAE IDF: non  IND: non  TEBs> 10ee-6  er: 2
28/06/1988 08:19:48/000  Debut IDF
28/06/1988 08:19:49/000  SGE IDF: oui  IND: non  TEBs> ------  er: 0
28/06/1988 08:19:50/000  SGE IDF: oui  IND: non  TEBs> ------  er: 0
28/06/1988 08:19:50/892  Fin IDF
28/06/1988 08:19:51/000  SGE IDF: oui  IND: non  TEBs> ------  er: 0
28/06/1988 09:02:31/816  seqt: 938          er: 9
28/06/1988 09:02:32/000  SAE IDF: non  IND: non  TEBs> 10ee-6  er: 9
28/06/1988 09:26:41/550  seqt: 1469         er: 2
28/06/1988 09:26:42/000  SAE IDF: non  IND: non  TEBs> 10ee-6  er: 2
28/06/1988 09:26:47/847  seqt: 1757         er: 1
28/06/1988 09:39:48/000  SAE IDF: non  IND: non  TEBs> 10ee-7  er: 1
28/06/1988 10:15:22/860  seqt: 2539         er: 1
28/06/1988 10:15:23/000  SAE IDF: non  IND: non  TEBs> 10ee-7  er: 1
28/06/1988 15:47:08/728  seqt: 9830         er: 29774
28/06/1988 15:47:09/000  SGE IDF: non  IND: non  TEBs> 10ee-2  er: 29774
28/06/1988 15:47:11/458  seqt: 9831         er: 43744
28/06/1988 15:47:12/000  SGE IDF: non  IND: non  TEBs> 10ee-2  er: 43744
28/06/1988 15:47:14/188  seqt: 9832         er: 43516
28/06/1988 15:47:15/000  SGE IDF: non  IND: non  TEBs> 10ee-2  er: 43516
```

SGE : Seconde Gravement Erronnée = Badly errored Second

SAF : Seconde Avec Erreur = Errored Second

IDF : Intervalle en Défaut = Not Free-Errored Second