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

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Tille: Discussionpaper on summary report on the mx 64 kbit/s Videophone Codec (see Annex 9 of # 181 R)

1. Bit rates

Typel, 2 and 3 are defined.
We will not repeat the comments listed in # 181 R. But some additional ideas are presented.

1.1. Still-picture

In S.Gr. VIII (Q.18/VIII) there is a Recommendation for natural and synthetic images under consideration to allow still picture transmission with CCIR 601 resolution using a 64 kbit/s channel. The working title is NIC (natural image communication). Applications are Videotex, Fax, Phototelegraphy, Teleconference etc.. The relevant Rec. should be finalized until the 1988-Plenary.

It would be of great advantage, if the same algorithm could be made available for still picture high resolution display to be offered by a 64 kbit/s picture phone service.

It is hoped that for NIC services equipment will be available on reasonable prices.

In recent discussion it became more and more obvious that one of the mainfeatures of a visual telephone service is the availibility of still pictures, independend of its transmission method.

1.2. Audio coding

We would like to add some arguments in favour of ISDN-version Type 2.

- Same terminal for normal telephone speech, which allow also communication with the Non-picturephone costumer.
- in a business environment a conference made beetween video and audio terminals is possible.

. The audio channal may be used consecutively for other services.

. Framing structure according to draft Rec. Y. 221

We will not neglect the points mentioned in favour of Type 1 and 3 Bitrates. Nevertheless we believe that there are a lot of items in favour of the Type 2. Some are given in report # 181 R. A very importend one is the NIC aspect.

Proposal:
The future algorithmn should allow the 3 Bitrates mentioned for Type 1, 2 and 3 i.e. 48, 64 and 112 kbit/s but with main concentration on 64 kbit/s.

2. Delay

There exists a network aspect which may influence the figures to be agreed upon in this respect.
For international communication using sophisticated speech processing and requiring satellite routing the acceptable delay of the communication signal namely for the speech signal is an import parameter. The values to be considered are laid down in Rec. G. 114. According to this Rec. the one way delay end to end should not exceed 400 ms for acceptable speech communication. As a satellite section needs 260 ms itself for the rest of the connection only 140 ms are available. This would forbid a processing time of more than about 80-100 ms. As we know, the H. 120-codec requires a delay of about 150 ms. Conferences being carried out sofar have not shown severe difficulties because of delay. In the light of this experience the FTZ is carrying out some studies on this aspect.

As a first result of those studies and
taking into account satellite transmission and further network requirements (f.e. digital switches) the delay to be allowed for the videotelephone codec should not exceed 250 ms.

Such an requirement will of course affect the videoformat to be processed by the new codec and the coding method.

3. Video format

3.1. Spatial resolution

Still picture with very high resolution should be transmitted with the aid of the NIC-Standard (s. item 1). Nevertheless from experiences with videoconferencing and picturephone also normal interactive picture communication in the business area comprises in a greater part of time a certain kind of non-moving pictures,

such as showing maps, displaying constructionsketches, drawings, drafts etc.

The conversation is carried out on discussions of such sketches mostly also pointing at certain details, making alterations, drafting texts and so on. Just talking face to face has not first priority for business-communication. Therefore the spatial resolution should be as high as possible. We are convinced relying on simulations having carried out, that it will be possible very shortly to realize the CIF as regard to spatial resolution, i.e. 288 lines with 360 pels for the luminance signal also on a 64 kbit/s channel. Studies are going on.

3.2. Picture frequency:

There are a lot of points in favour of 10 Hz picture frequency:

- simple way of link 625/50 and 525/60 systems
- simple relationship with CI Format
- 10 Hz should generally not be lowered in order to allow lip synchronism

4. Conclusion and Summary:

From some requirement for an acceptable service on 64 kbit/s picture phone codec the following proposals are made.

- Delay: The signal delay caused by the codec should not exceed 250 ms.
- Simple relationship with CIF is essential (because main application at the beginning is in the business area).
- High resolution still picture transmission on 64 kbit/s should be done with separate algorithm (f.e. see Q. 18/VIII)
- Bitrate for the videosignal 64 kbit/s as reference, but allowance for shifting to 48 kbit/s down and to 112 kbit/s up.
- Attempt should be made to aim at the spatial resolution of the CIF in order to allow a very good display for any kind of graphics (except the NIC-Standard)
- A picture frequence of 10 Hz should generally not be lowered.