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TITLE : INDICATION OF CLOCK ENVIRONMENT
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1. Introduction

This document discusses on how to indicate the clock environment, or the network is synchronous or asynchronous to which the terminal equipment including the H.261 codec is connected. We propose that the signalling for this purpose should be out-channel.

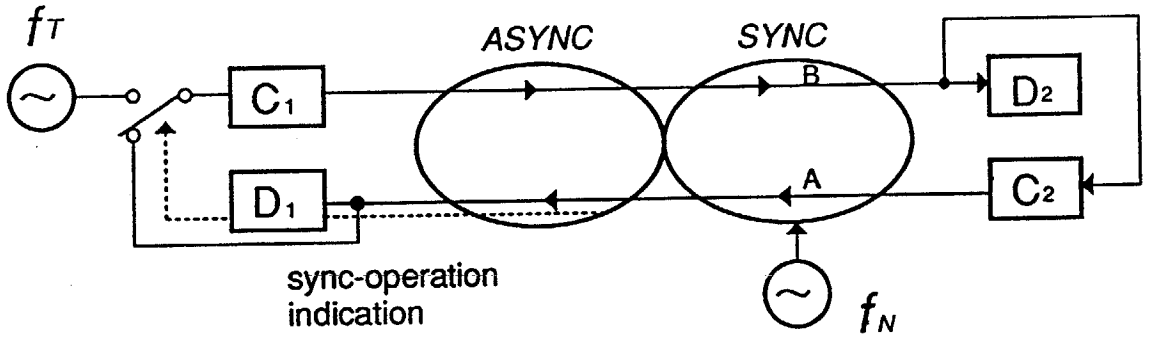
2. Problem

The encoder transmission clock which is used to send coded bitstreams to the network should be either of the following two modes;

- Looped timing for terminals connected to a synchronous network where the receiving clock is used for transmitting.

- Self timing for terminals connected to an asynchronous network where the independent free running clock is used for transmitting.

Terminals connected to an asynchronous network should operate in the self timing mode if the partner is also connected to the asynchronous network, while it should operate in the looped timing mode if the partner is connected to a synchronous network (see Figure 1).



1. Path A needs no action.
2. Path B needs synchronous operation of C_1, thus some indication from the network/C_2 is required.

Figure 1 - Interworking between synchronous and asynchronous networks

An idea to use looped timing even in the asynchronous environment had been tried, but it was abandoned at some time (see Doc. #452, Oslo, March 1989). We need now some indication of the remote terminal clock environment for the terminals in the asynchronous environment.

3. Possible channels for the indication

3.1 Out-channel

If we can know the partner's environment before or during the

communication, we may be able to switch the encoder clock source mode, manually for example.

Though there is provided an indication bit for this purpose in the H.120 Part 1 codec (Bit 8/TS0), it can not be applied to other transmission framings such as that for 1.5 Mbit/s.

3.2 In-channel - FAS

Using a spare bit in the FAS/H.221, we may realize this indication. Since the first thing to do at the receiver is to obtain FAS synchronization, we can know the partner's clock environment once H.221 framing is established. Then the transmitting clock mode is switched, enabling the remote terminal to obtain H.221 synchronization.

It is noted that the synchronous side terminal can not even establish clock synchronization if the remote terminal is operating in the self timing mode.

The problem for this solution is that spare bits in FAS are very scarce. Only one bit is remaining if we use three bits for the multiple connection numbering.

3.3 In-channel - BAS

It may be possible to include this indication in the extended BAS. This indication BAS should be sent first of all, otherwise the synchronous side terminal can not decode even FAS and BAS.

In the current AV242 procedure for the mxB channels, communication starts with 1B PCM audio in H.221 framing (Mode 0F), and then goes into the capability exchange sequence if A=0 is received from the remote terminal. Unless the clock environment is indicated first of all, the terminal in the synchronous side can neither start PCM audio, nor get into the communication procedures as A=0 is not received.

Transmitting such an indication at the start of communication may not belong to a well structured protocol.

4. Proposal

We propose the use of out-channel signalling for indicating the clock environment from the following reasons;

- This indication is transitional. All networks will become synchronous as ISDN penetrates.

- Audiovisual services will use only part of the multiplexed high speed digital transmission circuits. The clock source matching should be treated at this multiplexed signal level, perhaps at the interworking node between asynchronous and synchronous networks.

Accordingly the following wording is proposed at the corresponding paragraph of "§5.1 Bit rate" in the H.261 text;

> Selection of free-running or synchronized mode shall be by an external means.

END