INTERNATIONAL TELECOMMUNICATION UNION

ITU-T X.52

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

PUBLIC DATA NETWORKS

TRANSMISSION, SIGNALLING AND SWITCHING

METHOD OF ENCODING ANISOCHRONOUS SIGNALS INTO A SYNCHRONOUS USER BEARER

ITU-T Recommendation X.52

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation X.52 was published in Fascicle VIII.3 of the *Blue Book*. This file is an extract from the *Blue Book*. While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).

2 In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Recommendation X.52

METHOD OF ENCODING ANISOCHRONOUS SIGNALS INTO A SYNCHRONOUS USER BEARER[1)]

(Geneva, 1980)

The CCITT,

considering that

(a) Recommendation X.1 defines the user classes of service in public data networks;

(b) Recommendation X.2 defines the international user facilities in public data networks;

(c) Recommendations X.21 and X.21 *bis* define the interface between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) for synchronous operation;

(d) Recommendations X.50 and X.51 define the multiplexing scheme for the international interface between synchronous data networks;

(e) Recommendations X.60, X.61 and X.71 define the signalling system on international circuits between synchronous data networks;

(f) some circuits implementing synchronous data networks also will connect to those networks DTEs operating in user classes of service 1 and 2;

unanimously declares the following view:

1 Scope

1.1 In the case where two synchronous data networks offer service for DTEs in user classes of service 1 and 2, the transfer of the anisochronous signals between the networks shall be performed using a synchronous user channel of 600 bit/s in the standardized multiplexing schemes given in Recommendations X.50 and X.51 if one or both of the networks nationally use the synchronous user channel of 600 bit/s.

1.2 In the case where two synchronous data networks offer service for DTEs in user classes of service 1 and 2 but do not provide the 600-bit/s rate, the transfer of the anisochronous signals between those two networks shall be performed using a synchronous user channel of 2400 bit/s in the standardized multiplexing schemes given in Recommendations X.50 and X.51.

1.3 The method of encoding signals from DTEs in user classes of service 1 and 2 into the synchronous bearer shall be independent of the multiplexing scheme used.

1.4 The method of encoding shall be as defined in this Recommendation.

2 Encoding method

The encoding method implies that characters generated by DTEs in user classes of service 1 and 2 in accordance with Recommendation X.1 are transferred on international links as characters on a synchronous user channel, i.e. the transfer of characters on a synchronous user channel shall include the start signal as well as the stop signal with the following convention:

start polarity = binary zero;

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1) This Recommendation is only valid for interworking between synchronous data networks. For the interworking between anisochronous data networks the Series R Recommendations will apply.

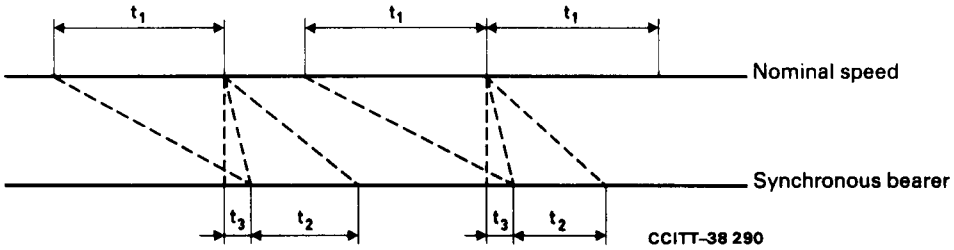
stop polarity = binary one.

Between any two characters on synchronous user channel the value of the bits shall be binary one.

The encoder and decoder shall be implemented in such a way that continuous start polarity (as well as continuous stop polarity) generated by a DTE can be transferred.

On the multiplexed link there need not be any relation between characters and envelopes.

The encoder shall be implemented in such a way that the time delay between the reception of a character at nominal speed and the start of sending the character on a synchronous user channel is less than 1 bit at the data signalling rate of the synchronous user channel used.



t_1 One character at nominal speed

t_2 One character at synchronous signalling rate

t_3 Time delay < 1.67 ms

FIGURE 1/X.52

ANNEX A

(to Recommendation X.52)

Location of the encoder

The location of the encoder, e.g. in the DCE in question or at a control point in the network, is a national matter. The location however will have no impact on the method described in this Recommendation.

When discussing the location of the encoder for harmonization reasons one should bear in mind that:

- in the case of a DCE located encoder, no special features for handling asynchronous signals are needed in network components such as concentrators and multiplexers and that all maintenance functions, subscriber line signalling scheme, local network modems, etc. implemented for the synchronous user classes of service can be used without any changes;
- if the encoder is placed at a central point, the data signalling rate on the local loop can be kept at the lowest possible rate allowing the use of a simple 2-wire modem and the sharing of conversion equipment at the central point by a number of subscribers.

ANNEX B

(to Recommendation X.52)

Higher data signalling rates

In the case where asynchronous DTEs operating at higher data signalling rates than given in Recommendation X.1 are connected to synchronous data networks, the same principle for encoding as given in the text of this Recommendation could be used and the relationship between data signalling rate and bearer channel rate shall be as shown in Table B-1/X.52.

TABLE B-1/X.52

Data signalling rate	Bearer channel rate
600 bit/s	2400 bit/s
1200 bit/s	2400 bit/s
2400 bit/s	4800 bit/s
4800 bit/s	9600 bit/s