ITU

INTERNATIONAL TELECOMMUNICATION UNION

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PUBLIC DATA NETWORKS

TRANSMISSION, SIGNALLING AND SWITCHING

INTERFACE BETWEEN SYNCHRONOUS DATA NETWORKS USING A 6 + 2 ENVELOPE STRUCTURE AND SINGLE CHANNEL PER CARRIER (SCPC) SATELLITE CHANNELS

ITU-T Recommendation X.55

(Extract from the *Blue Book*)

NOTES

1   ITU-T Recommendation X.55 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.

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Recommendation X.55

**INTERFACE BETWEEN SYNCHRONOUS DATA NETWORKS
USING A 6 + 2 ENVELOPE STRUCTURE AND SINGLE CHANNEL PER CARRIER
(SCPC) SATELLITE CHANNELS**

(Malaga-Torremolinos, 1984)

The CCITT,

considering

(a)   that the bearer rate recognized by the CCITT is 64 kbit/s;

(b)   that 64 kbit/s satellite channels on TDMA systems are not yet operational;

(c)   that 64 kbit/s channels on SCPC systems are under investigation;

(d)   that for an interim period only 48, 50 or 56 kbit/s channels via a satellite will be available in many cases;

(e)   that there is a requirement to interface transmission systems using an 8-bit envelope structure with such satellite systems,

recommends

that the fundamental parameters for a multiplexing scheme using an 8-bit envelope structure for transmission via a 56-kbit/s SCPC satellite channel should be as described in this Recommendation.

Note - In some cases, it may be necessary to adapt between 64 kbit/s and 56 kbit/s bearer rates.

1   Gross bit rate

For transmission on the international digital satellite link, the multiplexed bit stream shall have a gross bit rate of 56 kbit/s. On the tributary, each transmitted and received tributary data stream has the 8-bit envelope structure as recommended by Recommendation X.50.

The adaptation to the SCPC 56-kbit/s channel is achieved:

-      by suppressing the F bits (framing bits):

-      by using one out of 7 S bits (status bits) for framing.

2   Fundamental multiplex

2.1   *System capacity*

The capacity is the same as recommended in Recommendation X.50.

Note - Further study is required to accommodate user classes 7 and 11.

2.2   *Multiplex structure*

The multiplex is based on envelopes of 7 bits.

In a 7-bit envelope, bits 1-6 are information bits of the tributary channel and bit 7 is reserved for framing and signalling purposes (as described in Recommendation X.50) (see Figure 1/X.55).
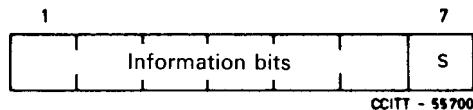
FIGURE 1/X.55

7-bit envelope

2.3 *Framing pattern*

One bit out of 7 S bits is used for framing purposes. The 72-bit framing pattern and the housekeeping bits ABCDEFGH as defined in Recommendation X.50 shall be used.

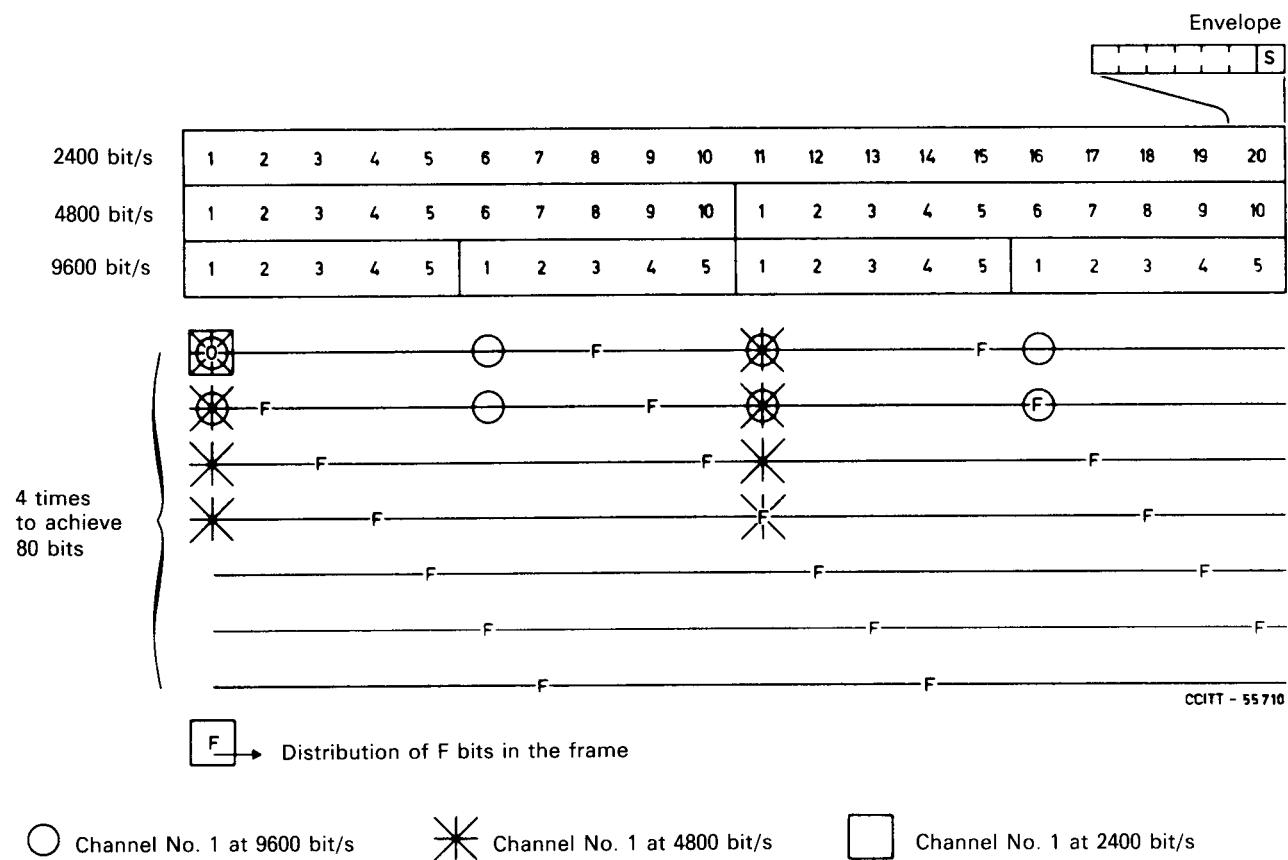The resulting framing scheme is shown in Figure 2/X.55.

FIGURE 2/X.55

Framing scheme

2.4 *Framing strategy*

2.4.1 *Loss of frame alignment*

The criterion for loss of frame alignment shall be the reception of 8 consecutive erroneous F bits.

2.4.2 *Reframing*

The criterion for reframing shall be the detection of 8 consecutive F bits.

2.4.3   *Alarm and consequent action*

When a loss of alignment is achieved:

-    the outgoing signals shall be set to all ones;

-    the state shall be signalled to the distant end as recommended in Recommendation X.50 via the housekeeping bit A.

3   Adaptation between 56 kbit/s and 64 kbit/s bearers (when used)

The 6 + 2 envelope structure of the 64 kbit/s bearer is described in Recommendation X.50.

3.1   *Insertion and deletion of F bits*

3.2   *Sharing of S bits between framing and signalling mechanism*

a)   At the transmit part:

One S bit out of 7 S bits is suppressed to be replaced by an F bit.

b)   At the received part:

The F bit is suppressed and replaced by the last value of the S bit of the tributary channel.

Note - The mechanism, described above, is chosen due to the fact that the information on the S bit changes very slowly. The process will only bring a delay of 6 bits for the signal signalling transition when the corresponding S bit is affected.

For each channel, only one out of 7 S bits is affected.