INTERNATIONAL TELECOMMUNICATION UNION

ITU-T Q.271

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

SPECIFICATIONS OF SIGNALLING SYSTEM No. 6

CONTINUITY CHECK OF THE SPEECH PATH

GENERAL

ITU-T Recommendation Q.271

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation Q.271 was published in Fascicle VI.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.

5.1 GENERAL

Because the signalling in System No. 6 does not pass over the speech path, facilities should be provided for making a continuity check of the speech path prior to the commencement of conversation. The check is not intended to eliminate the need for routine testing of the transmission path.

This specification relates only to that part of an international connection served by Signalling System No. 6. The part of the speech path to be checked may include a TASI circuit.

As the presence of active echo suppressors in the circuit would interfere with the continuity check, it is necessary to disable the suppressors during the check and to re-enable them, if required, after the check has been completed.

5.2 RELIABILITY OF THE SPEECH PATH ACROSS THE EXCHANGE

Administrations shall ensure the reliability of a connection through a switching machine (cross-office check) either on a per call basis or by a statistical method. With either method, the probability of the connection being established with an unacceptable speech path, transmission quality should not exceed 10^{-5} as the long-term average.

5.3 CONTINUITY CHECK OF THE SPEECH CIRCUIT BETWEEN EXCHANGES

The continuity check of the speech circuit will be done, link-by-link, on a per call basis prior to the commencement of conversation. The loop checking method used is specified in the following sections.

5.4 LOOP CHECKING METHOD

The continuity check transceiver (check-tone transmitter and receiver) is connected to the GO and RETURN paths of the outgoing circuit at the first and each succeeding exchange, excluding the last exchange, in that part of the international connection served by Signalling System No. 6. The check loop should be connected to the GO and RETURN paths of the incoming circuit at each exchange except the first in that part of the international connection served by Signalling System No. 6. A continuity check is considered successful when a tone is sent on the GO path and is received on the RETURN path within acceptable transmission and timing limits.

5.5 TRANSMISSION REQUIREMENTS FOR THE CONTINUITY CHECK

5.5.1 *Transmitting equipment*

The check-tone frequency will be 2000 ± 20 Hz.

The sending level of the check tone will be - 12 ± 1 dBm0.

5.5.2 *Check loop*

The check loop will have a loss of 0 dB, taking into account any difference between the relative levels of the two paths at the point of attachment.

5.5.3 *Receiving equipment*

The check-tone receiver will have the following characteristics:

5.5.3.1 *Operating requirements*

Signal frequency: 2000 ± 30 Hz

Signal level range: The absolute power level N of the check tone shall be within the limits

$(-18 + n) \leq N \leq (-6 + n)$ dBm

where n is the relative power level at the receiver input

Recognition time: 30 to 60 ms

The frequency and level range tolerances allow for variations at the sending end and for variations in line transmission that are considered acceptable.

5.5.3.2 *Non-operating requirements*

Signal frequency: outside the frequency band 2000 ± 200 Hz

Signal level: below or equal to $-22 + n$ dBm0

The limit is 10 dB below the nominal absolute level of the check tone at the input of the receiver. If the level fails below this point, transmission is considered unacceptable.

Signal duration: shorter than 30 ms

The level range of $(-18 + n) \leq N \leq (-6 + n)$ dBm will serve as a GO/NO-GO check on the links in that part of the international connection served by Signalling System No. 6.

5.5.3.3 *Release requirements*

If the receiver is used to test for the removal of check tone (see Recommendation Q.261, § 4.1.4):

- after recognition of tone, interruptions of up to 15 ms shall be ignored; this will prevent switching through the speech path prematurely;
- the indication of tone removal should not be delayed more than 40 ms; and
- the release level of the receiver should be lower than $-27 + n$ dBm.

5.6 CONTINUITY SIGNAL

The procedure for sending the continuity signal is given in Recommendation Q.261, § 4.1.4.

5.7 TIMING CONSIDERATIONS FOR THE CONTINUITY CHECK

5.7.1 *Time-out period of the continuity check*

The continuity check is considered to have failed if the receiver has not responded within a period determined by the Administration concerned. This period should not exceed 2 seconds.

The time-out period of the continuity check should always exceed the continuity recognition time, T_{CR}, given by:

$$T_{CR} = 2\,T_p + T_{IAM} + T_{TC} + T_L + T_R - T_T$$

where: T_p = one-way propagation time of the speech circuit and the signalling link (where they are the same),

T_{TC} = TASI clip time for two TASI systems in series (for connections not using TASI, $T_{TC} = \mathbf{0}$),

T_R = receiver response time,

T_L = loop connecting time (maximum),

T_T = transceiver connecting time (minimum),

T_{IAM} = emission time of the longest initial address message.

If retransmission of an IAM is to be included in T_{CR}, the following formula may be used:

$$T_{CR} = 4T_p + 2T_{IAM} + T_{ACU} + T_x + T_y + T_L + T_R - T_T$$

where: T_{ACU} = emission time of an ACU (length of an ACU),

T_x = time between receiving an IAM and emitting an ACU,

T_y = time between receiving an ACU and emitting an initial address message.

5.7.2 *Switching limes of continuity check equipment*

The connection and disconnection of the equipment used for the continuity check and also the disabling and subsequent enabling of echo suppressors should be related to the following stages of progress in the establishment of the connection:

a) *Preparation at System No. 6 exchange applying the transceiver.* - Action should be initiated at the termination of the handling time T_h of the initial address message, i.e. when it is inserted in the output buffer and is available for emission.

b) *Preparation at System No. 6 exchange connecting the check loop.* - Action should be initiated at the moment or recognition of the initial address message received.

c) *Disconnection at System No. 6 exchange connecting the check loop.* - Action follows the receipt of the continuity signal or the clear-forward signal, or the emission of signals indicating that the call cannot be established, e.g. circuit-group congestion signal.

d) *Disconnection at System No. 6 exchange applying the* transceiver. - Action should be initiated on the successful completion or the failure of the continuity check. Exceptionally, if disconnection has not previously occurred action should be initiated at the moment of recognition of the address-complete signals, the answer signals, signals indicating that the call cannot be established, or on the emission of a clear-forward signal.

It is recommended that the mean time, both for the connection and for the disconnection, be less than 100 ms. A mean time of 200 ms should not be exceeded. See Recommendation Q.261.