INTERNATIONAL TELECOMMUNICATION UNION

ITU-T Q.140

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

SPECIFICATIONS OF SIGNALLING SYSTEM No. 5

DEFINITION AND FUNCTION OF SIGNALS

ITU-T Recommendation Q.140

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation Q.140 was published in Fascicle VI.2 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 Q.140

1. DEFINITION AND FUNCTION OF SIGNALS

1.1 seizing signal (sent in the forward direction)

This signal is transmitted at the beginning of a call to initiate circuit operation at the incoming end of an international circuit and to seize equipment for switching the call either to the national network of the incoming country or to another international exchange.

1.2 proceed-to-send signal (sent in the backward direction)

This signal is sent from the incoming end of an international circuit, following the receipt of a seizing signal, to indicate that the equipment is ready to receive the numerical signals.

1.3 start-of-pulsing signal, also called for system No. 5 "KP signal" (sent in the forward direction)

This numerical type signal is sent on receipt of a proceed-to-send signal and may be used to prepare the incoming international register for the receipt of the subsequent numerical signals.

Two different KP signals are provided to discriminate between terminal and transit calls:

a) KP1, terminal; and

b) KP2, transit.

1.4 numerical signal (sent in the forward direction)

This signal provides an element of information necessary to effect the switching of the call in the desired direction. There is always a succession of numerical signals sent.

1.5 end-of-pulsing signal, also called for system No. 5 "ST signal" (sent in the forward direction)

This numerical type signal is sent to show that there are no more numerical signals to follow. The signal is always sent in semi-automatic as well as in automatic working.

1.6 busy-flash signal (sent in the backward direction)

This signal, which is sent only after the proceed-to-send signal, is sent to the outgoing international exchange to show that either the route, or the called subscriber, is busy. The conditions of use of this signal are as follows:

a) An international transit exchange *must* send this signal after register association, to indicate that there is congestion at that exchange or on the appropriate outgoing routes.

b) An incoming international exchange *must* send this signal, after register association, if there is congestion at that exchange or on the outgoing routes directly connected to it, but sending the signal *is optional* when there is congestion beyond that exchange (when there is congestion at a point in the national network of the incoming country or when the called subscriber's line is busy). This signal is optional because there are several countries that do not send it from their national networks.

Note - The receipt of the busy-flash signal at the outgoing exchange will cause:

- an appropriate indication to be given to the outgoing operator or to the calling subscriber; and
- the sending of the clear-forward by the outgoing exchange to release the international connection (except when otherwise arranged, for example, in this case of observations on circuits).

1.7 **answer signal (sent in the backward direction)**

This signal is sent to the outgoing international exchange to show that the called party has answered the call[1] .

In semi-automatic working, the signal has a supervisory function.

In automatic working, it is used:

- to start metering the charge to the calling subscriber;
- to start the measurement of call duration for international accounting purposes.

1.8 **clear-back signal (sent in the backward direction)**

This signal is sent to the outgoing international exchange to indicate that the called party has cleared. In the semi-automatic service, it performs a supervisory function. It must not permanently open the speech path at the outgoing international exchange.

In automatic working, arrangements must be made to clear the international connection, stop the charging and stop the measurement of call duration if, between 1 and 2 minutes after receipt of the clear-back signal, the calling subscriber has not cleared. Clearing of the international connection should preferably be controlled from the point where the charging of the calling subscriber is carried out.

Notes on the answer and clear-back signals. - See the corresponding Notes in Recommendation Q.120.

1.9 **clear-forward signal (sent in the forward direction)**

This signal is sent in the forward direction at the end of a call when:

a) in semi-automatic working, the operator at the outgoing international exchange withdraws her plug from the jack, or when an equivalent operation is performed;

b) in automatic working, when the calling subscriber hangs up or otherwise clears (as in the case of a subscriber's installation with extension telephones).

This signal is also sent after receipt of a busy-flash signal by the outgoing international exchange, and when there is forced release of the connection (see Recommendation Q.118, §§ 4.3.1 and 4.3.2 for automatic working and § 4.3.1 for semi-automatic working). This signal may also be sent after an abnormal release of an outgoing register in the case indicated in Recommendation Q.156 under § 3.6.2 a) 1.

1.10 **release-guard signal (sent in the backward direction)**

This signal is sent in the backward direction in response to the clear-forward signal. It serves to protect an international circuit against subsequent seizure as long as the disconnection operations controlled by reception of the clear-forward signal have not been completed at its incoming end.

1.11 **forward-transfer signal (sent the forward direction)**

This signal is sent to the incoming international exchange when the outgoing international exchange operator wants the help of an operator at the incoming international exchange.

The signal will normally serve to bring an assistance operator[2] into the circuit if the call is automatically set up at that exchange. When a call is completed via an operator (incoming or delay operator) at the incoming international exchange, the signal should preferably cause this operator to be recalled.

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1) See Recommendation Q.27 for the action to be taken to ensure that answer signals, both national and international, are transmitted as quickly as possible.

2) See the definition of assistance operator in § 1.1.6 of Recommendation Q.101.

1.12 *Diagrams showing signal sequence*

The sequence of signals in semi-automatic and automatic working is shown in Tables 1 and 2 of Annex 1 to Signalling System No. 5 specifications.

A description of the various operations corresponding to the various normal and abnormal conditions which may arise in setting up a call are given in the tables of Annex 2 to Signalling System No. 5 specifications.