



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

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TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

**SPECIFICATIONS OF SIGNALLING SYSTEM No. 6
SIGNALLING PROCEDURES**

**RELEASE OF INTERNATIONAL
CONNECTIONS AND ASSOCIATED
EQUIPMENT**

ITU-T Recommendation Q.268

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation Q.268 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.

Recommendation Q.268

4.8 RELEASE OF INTERNATIONAL CONNECTIONS AND ASSOCIATED EQUIPMENT

4.8.1 *Normal release conditions*

Connections are normally released in the forward direction as a result of the receipt of a clear-forward signal from the preceding exchange. In addition, provision is made for the normal release of connections (or circuits) as follows:

- on the continuity check failure: Recommendation Q.261, § 4.1.4,
- on receipt of an address-incomplete signal: Recommendation Q.261, § 4.1.6,
- on receipt of one of the congestion signals: Recommendation Q.261, § 4.1.7,
- on receipt of one of the called-party's-line-condition signals: Recommendation Q.261, § 4.1.8,
- on receipt of the blocking signal after sending an initial address message: Recommendation Q.266, § 4.6.1,
- in some cases, on receipt of the message-refusal signal: Recommendation Q.266, § 4.6.2.3,
- in some cases described under the treatment of unreasonable and superfluous messages: Recommendation Q.267, § 4.7.6.3, and Annex B to these Specifications,
- on receipt of a confusion signal: Recommendation Q.267, § 4.7.6.4.

If the conditions for the normal release of connections as described above are not fulfilled, release is provided as follows:

- in the release under abnormal conditions: § 4.8.5 below,
- on receipt of a call-failure signal: § 4.8.3 below,
- on failure to receive a clear-forward signal after receiving a clear-back signal: Recommendation Q.118, § 4.3.2,
- on failure to receive an answer signal: Recommendation Q.118, § 4.3.1,
- on failure to receive a clear-forward signal after sending a clear-back signal: Recommendation Q.118, § 4.3.3.

Address and routing information are released from memory in each of the exchanges of a connection as described in the following subsections:

4.8.1.1 *Outgoing international exchange*

Address and routing information stored at the outgoing international exchange can be erased on receipt of one of the following backward signals as covered in § 4.1 above:

- a) one of the address-complete signals,
- b) the address-incomplete signal,
- c) one of the congestion signals (unless an automatic repeat attempt is to be made, see § 4.4 above),
- d) one of the called-party's-line-condition signals, or
- e) the answer signal (received out of sequence),

or when the connection is cleared earlier.

4.8.1.2 *Incoming international exchange*

Address and routing information stored at the incoming international exchange can be erased on receipt of one of the above backward signals (or equivalent) from a national common channel system, or when one of the following signals as covered in § 4.1 above has been originated and sent to the outgoing international exchange:

- a) one of the address-complete signals,
- b) address-incomplete signal, or
- c) one of the congestion signals,

or on receipt of a clear-forward signal.

4.8.1.3 *International transit exchange*

Address and routing information stored at an international transit exchange can be erased on receipt of one of the backward signals, § 4.8.1.1, a) to e) above, on receipt of a clear-forward signal, or when one of the congestion signals is originated in that exchange. If the succeeding circuit in the connection utilizes System No. 5, the address and routing information can be released on sending the end-of-pulsing signal (ST) over the System No. 5 circuit as specified in Recommendation Q.152. Whenever one of the backward signals indicating an unsuccessful call is returned, the transit exchange connection and succeeding circuits shall be cleared.

4.8.2 *Abnormal release conditions - clear-forward, release-guard sequences*

4.8.2.1 *Inability to release in response to a clear-forward signal*

If an exchange is unable to return the circuit to the idle condition in response to a clear-forward signal, it should remove the circuit from service and send the blocking signal. Upon receipt of the blocking-acknowledgement signal, the release-guard signal is sent in acknowledgement of the original clear-forward signal.

4.8.2.2 *Inability to release in response to a backward signal*

If an exchange is unable to release a circuit in response to an address-incomplete, congestion, called-party's-line-condition, call-failure or confusion signal, it should remove the circuit from service by sending the blocking signal. Upon receipt of the blocking-acknowledgement signal, the clear-forward signal should be sent in reply to the original backward signal.

4.8.2.3 *Failure to receive a release-guard signal in response to a clear-forward signal*

If a release-guard signal is not received in response to a clear-forward signal before 4 to 15 seconds, the clear-forward signal will be repeated.

If, after sending a clear-forward signal, a release-guard signal is not received within a period of one minute after the first clear-forward signal, the maintenance personnel shall be alerted and a reset-circuit signal sent. The reset-circuit signal shall be repeated at one minute intervals until either an acknowledgement is received or maintenance intervention occurs. If there is no provision for sending reset-circuit signals, clear-forward signals shall be used instead.

4.8.3 *Call-failure signal*

The call-failure signal is sent as the result of time-out situations described in § 4.8.5 below. The call-failure signal is also sent whenever a call attempt fails and other specific signals do not apply, viz.:

- the confusion signal,
- the address-incomplete signal,
- the congestion signals, or
- the called-party's-line-condition signals.

Reception of the call-failure signal at any No. 6 exchange will cause the clear-forward signal to be sent and:

- a) an automatic repeat attempt to be made, or

- b) the appropriate signal or the appropriate tone or announcement to be sent to the preceding international exchange or to the national network.

The call-failure signal from System No. 6 will be converted to a busy-flash signal for transmission over a preceding link using System No. 4 or System No. 5. If the preceding link uses System No. 6, the call-failure signal is passed back.

4.8.4 *Reset-circuit signal*

In systems which maintain circuit status in memory, there may be occasions when the memory becomes mutilated. In such a case, the circuits must be reset to the idle condition at both exchanges to make them available for new traffic. Since the exchange with the mutilated memory does not know whether the circuit is idle, busy outgoing, busy incoming, blocked, etc., a reset-circuit signal should be sent for each affected circuit. (If complete groups or subgroups of circuits are involved, the reset-band signal sequence described in Recommendation Q.295, § 9.5 should be used.) On receipt of a reset-circuit signal, the unaffected exchange will:

- a) accept the signal as a clear-forward signal and respond by sending a release-guard signal, after the circuit has been made idle, if it is the incoming exchange on a connection in any state of call setup or during a call,
- b) accept the signal as a clear-back or call failure, whichever is appropriate, and respond by sending a clear-forward signal if it is the outgoing exchange on a connection,
- c) accept the signal as a clear-forward signal and respond by sending a release-guard signal if the circuit is in the idle condition,
- d) if it has previously sent a blocking signal, or if it is unable to release the circuit as described above, respond with the blocking signal. If an incoming or outgoing call is in progress, this call should be disconnected and the circuit returned to the idle (blocked) state. A clear-forward or release-guard signal may be sent. The blocking signal should be acknowledged by the affected exchange. If the acknowledgement is not received, the repetition procedure in § 4.8.5.4 should be followed,
- e) if it had previously received a blocking signal, respond by disconnecting any connected call, remove the blocked condition and restore the circuit to the idle state. If an outgoing call had been in progress, respond with a clear-forward signal or, in all other cases, a release-guard signal,
- f) if a reset-circuit signal is received after the sending of an initial address message but before receipt of a backward signal relating to that call, clear the circuit and make a repeat attempt on another circuit if appropriate,
- g) if a reset-circuit signal is received after having sent a reset-circuit signal, respond with a release-guard signal. The circuit should be restored to traffic,
- h) send an appropriate clearing signal on an interconnected circuit (e.g., clear-forward, or a suitable backward signal).

The affected exchange will then reconstruct its memory according to the received acknowledgement to the reset-circuit signal, and respond to this signal in the normal way, i.e. release-guard in response to a clear-forward, blocking-acknowledgement in response to a blocking signal.

In addition, an interconnected circuit may be cleared by the use of an appropriate signal. When both exchanges are arranged to handle reset-circuit signals, if no acknowledgement to the reset-circuit signal is received before 4-15 seconds, the reset-circuit signal should be repeated. If an acknowledgement for the signal is not received within 1 minute after the sending of the initial reset-circuit signal, maintenance personnel should be notified to permit manual restoration procedures. However, the sending of the reset-circuit signal should continue at 1-minute intervals until maintenance intervention occurs.

The use of reset-circuit and reset-band signals is optional. Therefore, in the situation where only one exchange is arranged to handle these signals if no acknowledgement is received before 4-15 seconds, the signalling procedure should be ceased and maintenance personnel notified to facilitate manual restoration of affected circuits. To the extent that selective use of the reset-circuit signals improves recovery from other fault situations, their use for this purpose is permitted. Although the indicated signals are optional, the ability to cooperate with exchanges transmitting them should be regarded as the preferred status.

4.8.5 *Abnormal release conditions - other sequences*

If the conditions for normal release as covered in § 4.8.1 above are not fulfilled, release will take place under the following conditions:

4.8.5.1 *Outgoing international exchange*

An outgoing international exchange shall:

- a) release all equipment and clear forward the connection on failure to meet the conditions for normal release of address and routing information as covered in 4.8.1.1 above before 20 to 30 seconds after sending the latest address message,
- b) release all equipment and clear forward the connection on failure to receive a clear-forward signal from the national network after having received a clear-back signal as provided in Recommendation Q. 118, or
- c) release all equipment and clear forward the connection on failure to receive an answer signal within the interval specified in Recommendation Q.118.

4.8.5.2 *Incoming international exchange*

An incoming international exchange shall:

- a) release all equipment, clear forward the connection into the national network and send back a call-failure signal in the following cases:
 - on failure to receive a continuity signal before 10 to 15 seconds after receipt of the initial address message, or
 - on failure to receive an address-complete or called-party's-line-condition signal from the national network (where expected) before 20 to 30 seconds after receipt of the latest address message, unless the timing for sending the address-incomplete signal (see § 4.1.6 above) is provided, or
- b) send the call-failure signal on failure to receive a clear-forward signal for the incoming circuit before 4 to 15 seconds after sending an address-incomplete, congestion, call-failure, confusion signal or a called-party's-line-condition signal indicating inability to complete the call. If a clear-forward signal is not received within a period of one minute after sending the call-failure signal, the maintenance personnel shall be alerted and a reset-circuit signal sent. The reset-circuit signal shall be repeated at one minute intervals until either an acknowledgement is received or maintenance intervention occurs. If there is no provision for sending reset-circuit signals, call-failure signals shall be used instead;
- c) release all equipment and clear forward the connection on failure to receive a clear-forward signal after having sent a clear-back signal as provided in Recommendation Q. 118.

4.8.5.3 *International transit exchange*

An international transit exchange shall:

- a) release all equipment, clear forward the connection and send back the call-failure signal in the following cases:
 - on failure to receive a continuity signal before 10 to 15 seconds after receipt of the initial address message, or
 - on failure to meet the conditions for normal release as covered in § 4.8.1.3 above, before 20 to 30 seconds after sending the latest address message, or
- b) send the call-failure signal on failure to receive a clear-forward signal for the incoming circuit before 4 to 15 seconds after sending an address-incomplete, congestion, call-failure, or confusion signal or a called-party's-line-condition signal indicating inability to complete the call. If a clear-forward signal is not received within a period of one minute after sending the call-failure signal, the maintenance personnel shall be alerted and a reset-circuit signal sent. The reset-circuit signal shall be repeated at one minute intervals until either an acknowledgement is received or maintenance intervention occurs. If there is no provision for sending reset-circuit signals, call-failure signals shall be used instead.

4.8.5.4 *Failure in the blocking/unblocking sequences*

An international exchange shall repeat the blocking or unblocking signal on failure to receive an acknowledgement signal in response to either the blocking or unblocking signals before 4 to 15 seconds. (See § 4.6.1 above for the blocking/unblocking sequence). If an acknowledgement signal is not received within a period of 1 minute after sending the initial blocking or unblocking signal, maintenance personnel should be alerted, and optionally the blocking or unblocking signal sent and repeated at one minute intervals until either an acknowledgement is received or maintenance intervention occurs.