# ITU-T  Q.311

INTERNATIONAL  TELECOMMUNICATION  UNION

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF  ITU

# SPECIFICATIONS  OF  SIGNALLING  SYSTEM  R1

# LINE  SIGNALLING

## 2600 Hz  LINE  SIGNALLING

## ITU-T  Recommendation  Q.311

(Extract from the *Blue Book*)

**NOTES**

1        ITU-T Recommendation Q.311 was published in Fascicle VI.4 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.311

## 2.1 2600 Hz LINE SIGNALLING

The line-signal coding arrangement is based on the application and removal of a single frequency tone (2600 Hz) as shown in Table 1/Q.311.

TABLE 1/Q.311

**Line signal code**

| Signal | Signal direction [1], [2] | Transmitted (sending) duration | Transmitted state [5], [6] | |
|---|---|---|---|---|
| | | | Originating end | Terminating end |
| Idle | ← → | continuous | 0 | 0 |
| Connect (seizing) | ----→ | continuous | 1 | 0 |
| Delay-dialling | ◄----- | continuous[3] | 1 | 1 |
| Start-dialling (proceed-to-send) | ◄—— | continuous[3] | 1 | 0 |
| Answer | ◄----- | continuous | 1 | 1 |
| Hang-up (clear-back) | ◄—— | continuous | 1 | 0 |
| Disconnect (clear-forward) | ——► | continuous | 0 | 0 or 1 |
| Ring-forward (forward-transfer) | ——► | 65-135 ms | 0 | 0 or 1 |
| Busy, re-order (congestion)[4] | ◄—— | – | off | on |

[1] ——► , ----→ indicates forward signalling state 0 or 1, respectively.
[2] ◄—— , ◄---- indicates backward signalling state 0 or 1, respectively.
[3] The durations of these signals are variable and depend upon when the succeeding signal occurs. To ensure proper registration of these signals, the transmitted signal durations should not be less than 140 ms.
[4] Busy and re-order (congestion) conditions are indicated by audible tones.
[5] 0: Tone on, or signalling bit state 0 in PCM systems.
[6] 1: Tone off, or signalling bit state 1 in PCM systems.

By taking advantage of the fixed order of occurrence of specific signals, both tone-on and tone-off signals are used to indicate more than one signal condition. For example, in the backward direction tone-on is used to indicate start-dialling (proceed-to-send), and terminating end hang-up (clear-back) signals without conflict. The equipment must retain memory of the preceding signal states and the direction of signals in order to differentiate between tone-on and tone-off signals.