



INTERNATIONAL TELECOMMUNICATION UNION

**ITU-T**

TELECOMMUNICATION  
STANDARDIZATION SECTOR  
OF ITU

**Q.411**

**SPECIFICATIONS OF SIGNALLING SYSTEM R2  
LINE SIGNALLING, ANALOGUE VERSION**

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**LINE SIGNALLING CODE**

**ITU-T Recommendation Q.411**

(Extract from the *Blue Book*)

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## NOTES

1 ITU-T Recommendation Q.411 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.411

### 2.1 LINE SIGNALLING CODE

#### 2.1.1 General

The System R2 line signalling, analogue version, is intended for use on carrier circuits. The line signals are transmitted link-by-link. The code for the transmission of line signals is based on the *tone-on-idle* signalling method. It is required that the circuits on which the system is employed are equipped in each direction of transmission with a signalling channel outside the speech frequency band. When the circuit is in the idle state, a low-level signalling tone is sent continuously in both directions over the signalling channels. The tone is removed in the forward direction at the moment of seizure and in the backward direction when the called subscriber answers.

The connection is released when the signalling tone is restored in the forward direction; release causes the tone to be restored in the backward direction. If the called party is the first to clear, the signalling tone is restored in the backward direction first. It is then restored in the forward direction either when the caller clears or when a certain interval has elapsed after recognition of the signalling tone in the backward direction. This signalling method, requiring only simple equipment, provides rapid signal recognition and retransmission. The signal transfer speed provided by continuous type signalling compensates for the need of signal repetition inherent in link-by-link transmission.

The signalling system is specified for one-way operation of 4-wire carrier circuits.

#### 2.1.2 Line conditions

Tone-on or tone-off denotes a certain line signalling condition. The line thus has two possible conditions in each direction, i.e. a total of four line signalling conditions. Taking into account the time sequence, the circuit may resume one of the six characteristic states shown in Table 1/Q.411.

TABLE 1/Q.411

State of the circuit	Line signalling condition	
	Forward	Backward
1. Idle	Tone-on	Tone-on
2. Seized	Tone-off	Tone-on
3. Answered	Tone-off	Tone-off
4. Clear-back	Tone-off	Tone-on
5. Release	Tone-on	Tone-on or off
6. Blocked	Tone-on	Tone-off

The transition from one signalling condition to another corresponds to the transfer of a line signal according to the definitions in § 1. To change from the release state to the idle state additional criteria (timing) are necessary to ensure a defined sequence corresponding to the transfer of the release-guard signal (see § 2.2.2.6 below).