INTERNATIONAL TELECOMMUNICATION UNION

ITU-T Q.415

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

SPECIFICATIONS OF SIGNALLING SYSTEM R2

LINE SIGNALLING, ANALOGUE VERSION

SIGNAL RECEIVER

ITU-T Recommendation Q.415

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation Q.415 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.

2.3.2 SIGNAL RECEIVER

2.3.2.1 *Recognition of the* tone-on *condition*

The receiver must have assumed or assume the *tone-on* condition when at the group distribution frame or at an equivalent point:

- the level of the received frequency has risen to -27 dBm0 or more;
- its frequency lies between 3825 ± 6 Hz.

The level of -27 dBm0 specified above does not preclude the use of individual adjustments in the channel translating equipment to compensate for constant level deviations.

2.3.2.2 *Recognition of the* tone-off *condition*

The receiver must have assumed or assume the *tone-off* condition when the level of the test frequency, at the group distribution frame or at an equivalent point, has dropped to the values shown in Figure 8/Q.415.

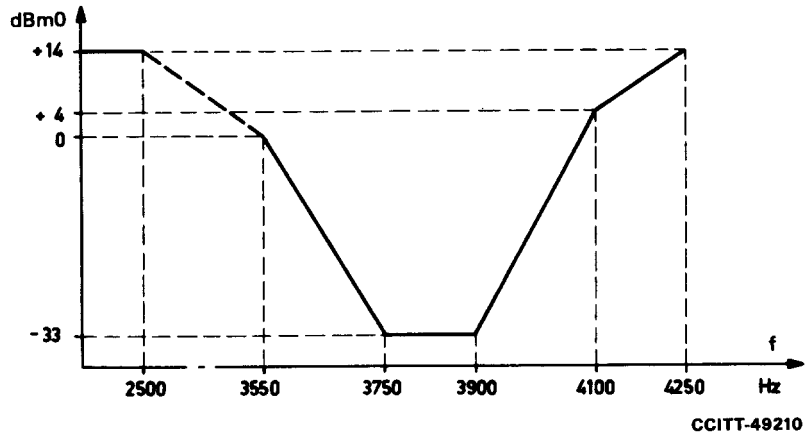

FIGURE 8/Q.415

Level limits for recognition of the "tone-off" condition

2.3.2.3 *Protection against near-end disturbances*

The signal receiver must not change state when any one of the following disturbing signals is applied at the 4-wire output of the associated speech channel looped at the group distribution frame or at an equivalent point:

- a sinusoidal signal whose level as a function of the frequency is shown in Figure 9/Q.415,
- a transient signal produced by the click generator (described in § 2.3.1.5 above) applied at the point where the channel is connected to the switching equipment, all level adjusting devices being set to such values encountered in practice which give rise to the worst disturbance.

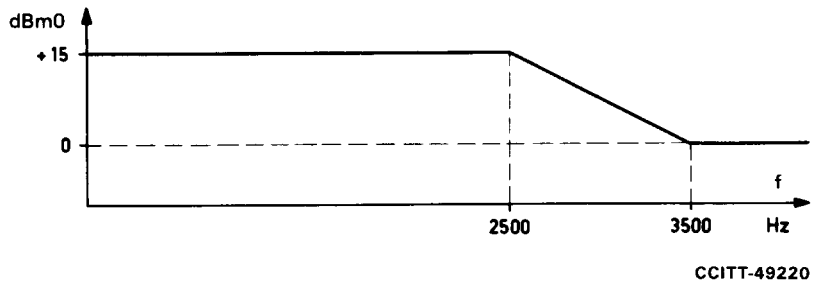

FIGURE 9/Q.415

Level limit for a sinusoidal disturbance signal to which the signalling receiver must remain insensible

2.3.2.4 *Overall response time of signal sender and receiver*

When the modulation equipment is looped at the group distribution frame or at an equivalent point, the overall response time is defined as the interval between the instant when a change signalling condition command is applied to the sender and the moment when the changed signalling condition appears at the receiver output. For each of the two possible changes of signalling condition, the overall response time must be less than 30 ms.

2.3.2.5 *Interference by carrier leaks*

The requirements stated in §§ 2.3.2.1, 2.3.2.3 and 2.3.2.4 above must be fulfilled in the presence of carrier leaks.

It is assumed that:

- when the receive level of the signalling tone is at its nominal value at the group distribution frame or an equivalent point, each carrier leak is present at a level of -26 dBm0;
- the level of the carrier leak varies proportionally with any variations in the level of the signalling tone.

2.3.2.6 *Interference by pilots*

The specified signalling system is not intended to work in the presence of those pilots specified by CCITT having a frequency differing by 140 Hz from the nearest multiple of 4 kHz (see Recommendation M.460).

On the other hand, the requirements stated in §§ 2.3.2.1, 2.3.2.2, 2.3.2.3, 2.3.2.4 and 2.3.2.5 above must be met in the presence of any other pilot recommended by the CCITT.

It is assumed that variations in level of the pilot and of the signalling tones are correlated.