



INTERNATIONAL TELECOMMUNICATION UNION

**ITU-T**

TELECOMMUNICATION  
STANDARDIZATION SECTOR  
OF ITU

**Q.424**

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

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**PROTECTION AGAINST THE EFFECTS OF  
FAULTY TRANSMISSION**

**ITU-T Recommendation Q.424**

(Extract from the *Blue Book*)

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## NOTES

1 ITU-T Recommendation Q.424 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.

### **3.3 PROTECTION AGAINST THE EFFECTS OF FAULTY TRANSMISSION**

Faulty transmission conditions in PCM systems can lead to degradation of the speech channels and erroneous signalling. In the case of primary PCM multiplex equipment operating at 2048 kbit/s failures due to loss of frame or multi-frame alignment and/or failure of any other important function results in both PCM terminals going into alarm condition in accordance with Recommendations G.732 and G.734.

Thus both PCM terminals apply the state corresponding to state 1 on the PCM line on each "receive" signalling channel at the interfaces with the switching equipment, as indicated in Table 4 of Recommendation G.732. In this way, the incoming switching equipment receives the equivalent of  $a_f = 1$ ,  $b_f = 1$  on the PCM line and the outgoing switching equipment receives the equivalent of  $a_b = 1$ ,  $b_b = 1$ .

These characteristics are taken into account in the present specifications (see § 3.2.4) so that:

- at the outgoing end (see Table 3/Q.422) a PCM fault results in a blocked state, seizure acknowledged state or clear-back state. This means that all circuits in the idle state of a faulty PCM multiplex will be blocked against seizure and that seized circuits will go to or remain in the seizure acknowledged or clear-back state;
- at the incoming end (see Table 4/Q.422) a PCM fault can be identified and appropriate actions can be taken.

When the signalling equipment is a part of a digital exchange, it may receive alarm indications in a form other than both signalling bits in state one. The failure may be detected by the signalling equipment or an indication be received from the PCM terminal according to Recommendation G.734.

When the signalling equipment recognizes a failure it must:

- block the detection of signalling transitions to avoid recognition of erroneous signalling codes caused by the failure. This action must be taken as soon as possible and at least within 3 ms as specified in Recommendation G.734 for a PCM terminal,
- react as specified in Tables 3/Q.422 and 4/Q.422 when a signalling code  $a = 1$ ,  $b = 1$  is detected at the input of signalling equipment situated at the analogue access of a PCM terminal equipment complying with Recommendation G.732.