



INTERNATIONAL TELECOMMUNICATION UNION

**ITU-T**

TELECOMMUNICATION  
STANDARDIZATION SECTOR  
OF ITU

**Q.110**

**GENERAL RECOMMENDATIONS ON TELEPHONE  
SWITCHING AND SIGNALLING**

**CLAUSES APPLICABLE TO ITU-T STANDARD  
SYSTEMS**

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**GENERAL ASPECTS OF THE UTILIZATION  
OF STANDARDIZED CCITT SIGNALLING  
SYSTEMS ON PCM LINKS**

**ITU-T Recommendation Q.110**

(Extract from the *Blue Book*)

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## NOTES

1 ITU-T Recommendation Q.110 was published in Fascicle VI.1 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.110**

### **2.0 GENERAL ASPECTS OF THE UTILIZATION OF STANDARDIZED CCITT SIGNALLING SYSTEMS ON PCM LINKS**

#### **2.0.1     *Signalling Systems No. 4 and No. 5***

Signalling Systems No. 4 and No. 5 are in-band signalling systems. It is not planned to specify modified versions of these systems for application to PCM transmission systems.

Should it be required to use one of these signalling systems on circuits routed partly or wholly via PCM transmission systems it is recommended that the standard in-band signalling arrangements for both line and interregister signals be used. The circuits should be connected on a 4-wire basis to appropriate analogue inputs and outputs of the PCM transmission system.

When used at analogue exchanges the circuits should be connected on a 4-wire basis to appropriate analogue inputs and outputs of a PCM transmission system conforming to Recommendations G.732 [1] or G.733 [2].

At digital exchanges, circuits should be connected to PCM interfaces conforming to Recommendation Q.503.

#### **2.0.2     *Signalling System No. 6***

For the transmission of signalling information over digital systems a digital version of Signalling System No. 6 has been developed and is specified in Recommendations Q.251 and Q.295.

Alternatively, the analogue version of System No. 6, as also specified in Recommendations Q.251 to Q.295 may be used without modifications by replacing the analogue voice-frequency channel of the signalling data link by PCM voice-frequency channels. In this case, the connection of the modem to the PCM transmission channel should be made on a 4-wire basis to the analogue input and the analogue output.

#### **2.0.3     *Signalling System No. 7***

Signalling System No. 7 has been developed for the use in integrated digital networks. It is optimized for 64 kbit/s PCM transmission channels.

In addition, it can be used on analogue transmission channels with lower bit rates.

#### **2.0.4     *Signalling System R1***

Signalling System R1, as specified in Part I of Fascicle VI.4, may be used without modification on PCM voice-frequency channels by direct connection of the circuits to appropriate analogue inputs and outputs of the PCM transmission system.

An alternative method of transmitting the line signals via a PCM system as specified in Recommendation G.733 has been developed as the digital version of System R1. Details are given in Recommendations Q.314 to Q.316. The multifrequency interregister signals are applied in-band via the analogue input of the speech circuit.

At digital exchanges, circuits should be connected to PCM interfaces conforming to Recommendation Q.503.

### 2.0.5 Signalling System R2

The analogue version of System R2 line signalling cannot be transmitted via an analogue input of a PCM system since these line signals are sent out-band using a 3825 Hz signalling channel. The digital version of System R2 line signalling specified in Recommendations Q.421-Q.424 has been developed for use with PCM systems specified in Recommendation G.732 [1]. The multi-frequency inter-register signals are applied in-band via the input of the speech circuit. At digital exchanges, circuits should be connected to PCM interfaces conforming to Recommendation Q.503.

#### References

- [1] CCITT Recommendation *Characteristics of primary PCM multiplex equipment operating at 2048 kbit/s*, Vol. III, Fascicle III.3, Rec. G.732.
- [2] CCITT Recommendation *Characteristics of primary PCM multiplex equipment operating at 1544 kbit/s*, Vol. III, Fascicle III.3, Rec. G.733.