INTERNATIONAL TELECOMMUNICATION UNION

ITU-T Q.113

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

GENERAL RECOMMENDATIONS ON TELEPHONE SWITCHING AND SIGNALLING

CLAUSES APPLICABLE TO ITU-T STANDARD SYSTEMS

CONNECTION OF SIGNAL RECEIVERS IN THE CIRCUIT

ITU-T Recommendation Q.113

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation Q.113 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.

2.2 CONNECTION OF SIGNAL RECEIVERS IN THE CIRCUIT

2.2.1 The line signal receivers are permanently connected to the 4-wire side of the circuit. The register signal receivers in System No. 5 are connected to the 4-wire side of the circuit when the register is associated with the circuit for the setting up of the call; the same is valid (in the international exchanges) for the register signal receivers in Systems R1 and R2.

2.2.2 An in-band line signal receiver should be protected against disturbing currents (voice currents or possibly noise), coming from the near end of the circuit, by a buffer amplifier or other arrangement. The arrangement used should introduce an appropriate supplementary attenuation in such a manner that, at the point where the line signal receiver is connected, these disturbing currents are of such a level that they cannot:

- operate the line signal receiver;
- interfere with the reception of signals by operating the guard circuit of the line signal receiver.

The additional attenuation introduced should in consequence take account of:

a) the relative level *n* at the point where the signal receiver is connected (this relative level is obtained by assuming a zero relative level at the distant origin of the circuit);

b) the minimum permissible signal level at the input to the signal receiver, for example:

-18 + *n* dBm in the case of System No. 4 (see Recommendation Q.123 § 3.2.1),

-16 + *n* dBm in the case of System No. 5 (see Recommendation Q. 144 § 2.4.1);

c) the maximum permissible level for disturbing currents (voice currents and switching noise) coming from the near end of the circuit. The maximum level of voice current might be assumed to be, for example, + 10 dBm0 in the direction *opposite* to that of the signals. The nature of the switching noises depends on the national systems used;

d) any attenuation (terminating set and possibly pads) between the point where the signal receiver is connected and the point where the near-end disturbing currents are considered;

e) a safety margin to give an appreciable reduction of the level of disturbing currents coming from the near end [as defined in c)] compared to the minimum level of the signal as defined in b).

2.2.3 When a register-signal receiver is connected to the circuit, the exchange side of the circuit is disconnected and hence the receiver is not subject to near-end disturbances.

2.2.4 The Recommendations of Volume III concerning international circuits must still be met after the connection of a signal sender and a signal receiver and of the switching equipment. In consequence, it is necessary to fix the limits of input and output impedance, insertion loss, attenuation distortion, non-linear distortion, balance, and crosstalk of line signal senders and receivers; an example of specification clauses concerning these conditions is given in Recommendation Q.114.