INTERNATIONAL TELECOMMUNICATION UNION

ITU-T K.7

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

PROTECTION AGAINST INTERFERENCE

PROTECTION AGAINST ACOUSTIC SHOCK

ITU-T Recommendation K.7

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation K.7 was published in Volume IX 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 K.7

PROTECTION AGAINST ACOUSTIC SHOCK

(Geneva, 1964; modified at Malaga-Torremolinos, 1984)

In certain unfavourable circumstances, sudden transient voltages of exceptionally high instantaneous amplitude, of the order of 1 kV for example, may occur across a telephone set which is normally connected to a metal wire line, as a result of electromagnetic disturbances affecting the line.

If such voltages occur during a telephone call, they are liable to cause, through the earphone, such strong sound pressure as to endanger the human ear and the nervous system.

Such bursts are most likely to occur when lightning protectors are inserted in the two conductors of a telephone line and do not function simultaneously, so that a compensating current flows through the telephone. The CCITT therefore recommends the use, particularly on lines equipped with vacuum lightning protectors, of protection devices against acoustic shock arising from inadmissibly high induced voltages (see Chapter I/6 of the *Directives*, page 16).

Such devices consist, for example, of two rectifiers, in parallel and with opposite polarities, or of other semiconductor components connected directly in parallel to the telephone receiver.

For telephone sets of more recent design, sudden voltage bursts liable to occur in the receiver may be eliminated by ensuring that the electrical circuits between the access to the line where dangerous voltages originate and the earphone itself have suitable characteristics.

It is also recommended that the proposed provisions should limit the aural discomfort which might be caused by abnormal electrical signals applied to subscriber systems as a result of erroneous operation or unwanted actuation of the equipments to which subscriber systems are connected.

The provisions adopted to provide protection against acoustic shock should:

- be compatible with the technical requirements applicable to the equipment;
- facilitate performance checks;
- not noticeably impair telephone transmission quality.

For this purpose, it is particularly recommended that:

1) with regard to specific devices, their dimensions should be such that they occupy a small space, so that they can be placed in the case of the subscriber’s or operator’s telephone receiver;
2) the electrical characteristics should not show significant changes under the temperature and humidity conditions to which the device is subjected in service;
3) effectiveness should be checked in conformity with the provisions of CCITT Recommendation P.36.