INTERNATIONAL TELECOMMUNICATION UNION

ITU-T V.15

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

DATA COMMUNICATION OVER THE TELEPHONE NETWORK

USE OF ACOUSTIC COUPLING FOR DATA TRANSMISSION

ITU-T Recommendation V.15

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation V.15 was published in Fascicle VIII.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 V.15

USE OF ACOUSTIC COUPLING FOR DATA TRANSMISSION

(Geneva, 1972; amended at Malaga-Torremolinos, 1984)

Note - Acoustic coupling is a technique used to couple the output of a modem to an analogue telecommunication facility using acoustic energy/power between the device and a telephone instrument. As such, it provides for minimum complexity of attachment as well as excellent galvanic isolation. However, the technique does limit the data signalling rates used and does limit the functionality which can be provided by the associated modem. Since this arrangement will generally be used to communicate with a permanently installed V Series modem at a remote station, the characteristics of the modem will, accordingly, comply with requirements defined elsewhere in these Series V Recommendations, e.g., V.21 or V.23. As far as functionality permits, interfaces with the associated DTE will be as defined in those Recommendations. Because of operator intervention required in manipulating the telephone handset, automatic calling and automatic answering are not normally considered part of the functionality of an acoustically coupled modem. However, an acoustically coupled modem can call a remote station which has automatic answering capability and can observe the protocol defined in Recommendation V.25, § 6, "Manual data station calling automatic answering data station" as modified herein.

The CCITT,

considering

that there is a wide variety of telephone instruments in existence and that the acoustic path involved in the use of any coupling device cannot be accurately prescribed for all cases, and hence it will be difficult to ensure satisfactory transmission in all situations,

recommends

1 that acoustic coupling of data transmission equipment via telephone instruments to the telephone transmission network should not be used for permanent installations.

It is, however, recognized that there may be a need for a means to provide temporary connection of portable data transmission equipment to the network in circumstances where it may not be possible to obtain convenient access to the subscriber's line terminals.

The use of acoustic coupling for temporary communications is subject to the agreement of the Administration in charge of the telephone network to which the equipment will be connected.

If an Administration decides to permit acoustic coupling for temporary data transmission stations, the acoustic coupling equipment conforms to the following:

1) The maximum power output of the subscriber's equipment to the line shall not exceed 1 mW at any frequency.

   The mean permitted telephone line signal power shall not exceed -13 dBm0.

2) If p is the signal power in the frequency band 0-4 kHz, the signal power outside this band shall not exceed the following values when integrated over any period of approximately 3 seconds:

   p - 20 dB in the band 4 to 8 kHz,

   p - 40 dB in the band 8 to 12 kHz,

   p - 60 dB in each 4-kHz band above 12 kHz.

3) The frequencies emitted by the transducer shall be such as not to interfere with national and international telephone signalling systems and pilot signals involved in the telephone connection envisaged.

4) Adequate protection shall be provided in the transducer to avoid causing any dangerous electric potential and currents to the telephone system.

5) It shall not be possible to cause acoustic shock to telephone users under any normal condition or when the acoustic coupler develops any single fault.

6) The mechanical arrangements of the transducer shall not cause mechanical damage to the telephone instrument.

7) In addition to the contents of this Recommendation, the regulations of the national Administration must also be complied with.

2 that acoustically coupled equipment be compatible with "hard-wired counterparts" at the remote location to the extent that:

1) The characteristics of the equivalent V Series (V.21, V.23, etc.) modem line signals are complied with (otherwise communication will be impossible).

2) An equivalent V.24 interface is provided to the DTE, with the following exceptions:

- circuit 108 is power ON indicator only, and cannot be used to control the connection of the modem to the line;
- circuit 125 is inoperative; only manual answering can be accomplished.

3) Acoustically coupled modem equipment designed to operate with remote modems:

- which have automatic answering capability, and
- which are specifically dedicated and are adapted (by means of optionally extended answer tone duration) to working with acoustically coupled calling stations

shall operate in the mode prescribed in Recommendation V.25, § 6 where placement of the telephone instrument handset on the acoustic coupler by the operator is tantamount to depressing a data button, as specified in § 6.

These modems shall also comply with the response time requirements of circuits 106 and 109 as specified in the appropriate modem Recommendation.