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SERIES P: TELEPHONE TRANSMISSION QUALITY

Subscribers' lines and sets

Coupling Hearing Aids to Telephone sets

ITU-T Recommendation P.370

(Previously "CCITT Recommendation")

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FOREWORD

The ITU-T (Telecommunication Standardization Sector) is a permanent organ of the International Telecommunication Union (ITU). The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, March 1-12, 1993).

ITU-T Recommendation P.370, was prepared by ITU-T Study Group 12 (1993-1996) and was approved under the WTSC Resolution No. 1 procedure on the 30th of August 1996.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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SUMMARY

This Recommendation has been updated from Recommendation P.37, Coupling Hearing Aids to Telephone sets.

Clause 4 covers inductive coupling and is technically similar to the original Recommendation P.37. Clause 4 however now includes the relevant figures that were previously referred out to other Recommendations. It presents recommended levels and frequency characteristics for the inductive field at the telephone earphone relative to a sound level presented at the same earphone.

Clause 5 covers additional amplification that may be provided for the benefit of hearing impaired users, and only editorial changes have been made to the text originally contained in Recommendation P.37. Limits for the additional amplification and range of volume control are given. Frequency response is also covered.

Clause 6 introduces the possibility of electrical coupling of a telephone set to a hearing aid. It is compatible with IEC Publication 118 Part 6, which covers the characteristics of hearing aid electrical input circuits. The electrical output level relative to the sound level in the same telephone's earphone is given in this Recommendation, together with frequency response, source impedance and maximum output level.

Technically this Recommendation is compatible with similar documents recently drafted within ETSI covering the same subjects.

FOREWORD

It is recognized that there is a sizeable proportion of telephone users that have difficulty in conversing over a telephone connection due to hearing loss. To alleviate these difficulties special means have been provided in many national systems to enable hearing impaired users to couple their hearing aids inductively to the telephone receiver, and a number of national/international specifications define characteristics for this form of coupling. Clause 4 addresses the requirements for successful inductive coupling of hearing aids to telephone sets.

Furthermore, it is also recognized that many hearing impaired users are able to have satisfactory telephone conversations while coupling their hearing aids acoustically to the telephone receiver, or even using the telephone handset without a hearing aid. This latter situation is possible due to the fact that under good conditions a telephone connection can be louder than a face-to-face conversation over a one-metre air path by up to 30 dB. Provision of additional amplification in the mouth-to-ear path can greatly increase the proportion of telephone conversations involving hearing impaired users that are rated "good". Clause 5 addresses this form of coupling.

Certain national standards also exist to enable direct electrical connection of hearing aids to telephone apparatus. This form of coupling is addressed in clause 6, and has been written to be compatible with the IEC Publication 118-6, 1984, covering the characteristics of electrical input circuits for hearing aids.

NOTES

- 1 Care should be taken when designing hearing aids to include sufficient immunity to radio frequency interference to avoid disturbances arising from the detection of radio signals emitted by cordless and mobile telephones.
- 2 Tests have shown that telephone earphones having low acoustic impedance, which exhibit less low frequency loss due to leakage effects, couple acoustically very well into hearing aids by presenting a much flatter overall frequency characteristic to the ear of the user than conventional earphones having high acoustic impedance.

COUPLING HEARING AIDS TO TELEPHONE SETS

(Geneva, 1996)

1 Scope

Clause 4 applies to telephone handsets having supra-aural earphones that can be connected to the Public Switched Telephone Network (PSTN) or the Integrated Services Digital Network (ISDN) which are intended for direct application to the ear (e.g. traditional handsets, operators' headsets) and which provide a magnetic field for coupling to hearing aids. It specifies the level, linearity and frequency dependence of the magnetic field strength produced by the handset and characteristics for the calibrated probe coil.

Clause 5 specifies the electro-acoustic performance characteristics of telephony terminals which are intended for direct application to the ear (e.g. traditional handsets, operators' headsets) and which provide, at the earphone, additional amplification in the receiving direction compared with the Receiving Loudness Rating (RLR) specified in the requirements of the national system.

Clause 6 specifies the electrical characteristics for the electrical coupling of the telephony function, implemented telecommunication terminal equipment, to hearing aids. It specifies the level and frequency response relative to the acoustic output at the earphone, also the noise and maximum level.

Annex A specifies the measuring method for an acousto-magnetic adapter that converts the acoustic output of an associated telephone receiver to a magnetic field, in accordance with 4.2.1 and 4.2.2, that can be received by the magnetic pick-up coil in a hearing aid.

2 Normative references

The following Recommendations, and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

- IEC Publication 118-6: 1984, *Hearing aids – Part 6: Characteristics of electrical input circuits for hearing aids*.
- ITU-T Recommendation P.10 (1993), *Vocabulary of terms on telephone transmission quality and telephone sets*.
- IEC Publication 118-4: 1981, *Hearing aids – Part 4: Magnetic field strength in audio-frequency induction loops for hearing aid purposes*.
- IEC Publication 118-1: 1995, *Hearing aids – Part 1: Hearing aids with induction pick-up coil input*.
- ITU-T Recommendation P.340 (1996), *Transmission characteristics of hands-free telephones*.
- ITU-T Recommendation G.121 (1993), *Loudness Ratings (LRs) of national systems*.
- IEC Publication 130-8: 1976, *Connectors for frequencies below 3 MHz – Part 8: Concentric connectors for audio circuits in radio receivers*.
- IEC Publication 268-11: 1987, *Sound system equipment – Part 11: Application of connectors for the interconnection of sound system equipment*.
- ITU-T Recommendation P.57 (1993), *Artificial ears*.
- CCITT Recommendation P.48 (1988), *Specification for an intermediate reference system*.

¹⁾ Previously Recommendation P.37.