

RECOMMENDATION ITU-R BS.1283-1*

**A guide to ITU-R Recommendations for subjective
assessment of sound quality**

(Question ITU-R 55/6)

(1997-2003)

The ITU Radiocommunication Assembly,

considering

- a) that ITU-R has issued several Recommendations on subjective methods of assessing sound quality;
- b) that methods used for the subjective assessment depend on the intended purpose of the assessment of sound quality itself and of the performance of audio systems,

recommends

1 that subjective assessments are carried out according to the following ITU-R Recommendations:

- ITU-R BS.1284 General methods for the subjective assessment of sound quality;
- ITU-R BS.1116 Methods for the subjective assessment of small impairments in audio systems, including multichannel sound systems;
- ITU-R BS.1285 Pre-selection methods for the subjective assessment of small impairments in audio systems;
- ITU-R BS.1286 Methods for the subjective assessment of audio systems with accompanying picture;
- ITU-R BS.1534 Method for the subjective assessment of intermediate quality level of coding systems;

2 that the applicability of one or more of the Recommendations should be decided, based on the purpose of the subjective assessment tests, before the tests are designed. The general considerations governing the range of applications of ITU-R Recommendations are given in Appendix 1.

Appendix 2 contains references to similar standards and Recommendations produced by international organisations.

* Radiocommunication Study Group 6 made editorial amendments to this Recommendation in 2002 in accordance with Resolution ITU-R 44.

Appendix 1

General considerations governing the range of applications of ITU-R Recommendations relating to the subjective assessment of sound quality

The methods used for the subjective assessment of sound quality itself and of the performance of audio systems depend to some extent on the intended purpose of the assessment. A number of Recommendations exist and this Recommendation gives guidance on the use of the other Recommendations.

Recommendation ITU-R BS.1284 – General methods for the subjective assessment of sound quality: is intended for the general assessment of sound quality. It refers to Recommendation ITU-R BS.1116 which contains common requirements.

Recommendation ITU-R BS.1116 – Methods for the subjective assessment of small impairments in audio systems, including multichannel sound systems: is intended as the most critical methodology. It is intended for use in the assessment of systems which introduce impairments so small as to be undetectable without rigorous control of the experimental conditions and appropriate statistical analysis. If used for systems that introduce relatively large and easily detectable impairment, it leads to excessive expenditure of time and effort and may also lead to less reliable results than those obtained by employing a simpler test method. Recommendation ITU-R BS.1116 forms the base reference for the other Recommendations, which may contain additional special conditions or relaxations of the requirements of Recommendation ITU-R BS.1116.

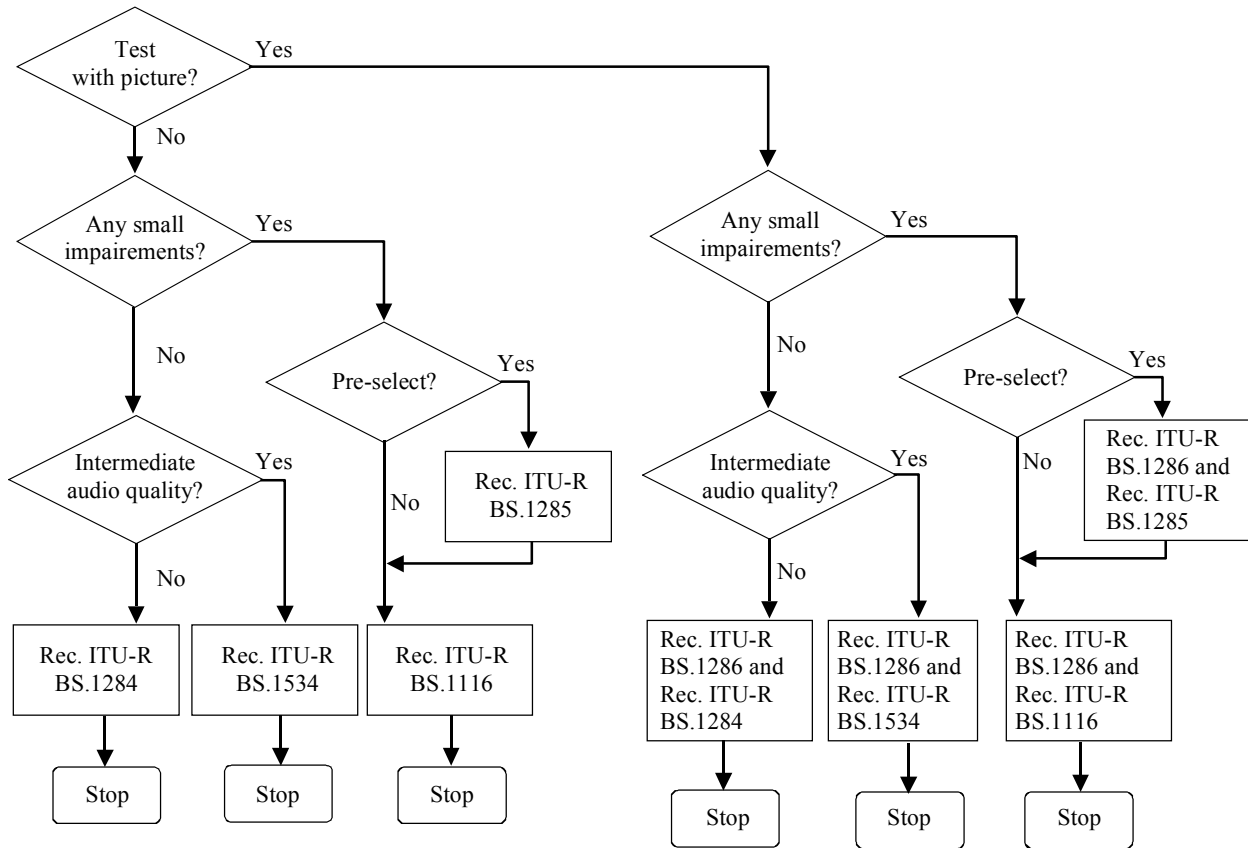
Recommendation ITU-R BS.1285 – Pre-selection methods for the subjective assessment of small impairments in audio systems: is intended for the preliminary screening of audio systems, prior to the application of the more stringent assessment methods of Recommendation ITU-R BS.1116. This screening will obviate the need for further tests of systems which introduce large impairments.

Recommendation ITU-R BS.1286 – Methods for the subjective assessment of audio systems with accompanying picture: is intended to cover those aspects of subjective assessment which are especially relevant to the case where the sound is accompanied by related pictures. Some aspects of the perceived sound quality are affected by the accompanying visual material.

Recommendation ITU-R BS.1534 – Method for the subjective assessment of intermediate quality level of coding systems: is intended to cover those aspects of subjective assessment of intermediate quality level of coding systems. It is intended to give a reliable and repeatable measure of systems having audio quality, which would normally fall in the lower half of the impairment scale used by Recommendation ITU-R BS.1116.

Clearly, some areas of application overlap. The applicability of one or more of the Recommendations should be decided, based on the purpose of the tests, before the tests are designed. The flow chart shown in Fig. 1 may be used to assist in the choice of appropriate Recommendations.

FIGURE 1
Flow chart



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Appendix 2

Bibliography of existing Recommendations and other relevant documents of international organizations concerning the methodology of quality assessment in audio and vision systems

1 ITU-R documents

1.1 ITU-R Recommendations

1.1.1 Sound

Recommendation ITU-R BS.645 – Test signals and metering to be used on international sound programme connections.

Recommendation ITU-R BS.708 – Determination of the electro-acoustical properties of studio monitor headphones.

Recommendation ITU-R BS.775 – Multichannel stereophonic sound system with and without accompanying picture.

Recommendation ITU-R BS.1116 – Methods for the subjective assessment of small impairments in audio systems, including multichannel sound systems.

Recommendation ITU-R BS.1283 – Subjective assessment of sound quality – A guide to existing Recommendations.

Recommendation ITU-R BS.1284 – Methods for the subjective assessment of sound quality – General requirements.

Recommendation ITU-R BS.1285 – Pre-selection methods for the subjective assessment of small impairments in audio systems.

Recommendation ITU-R BS.1286 – Methods for the subjective assessment of audio systems with accompanying pictures.

Recommendation ITU-R BS.1387 – Method for objective measurements of perceived audio quality.

Recommendation ITU-R BS.1534 – Method for the subjective assessment of intermediate quality level of coding systems.

1.1.2 Vision

Recommendation ITU-R BT.500 – Methodology for the subjective assessment of the quality of television pictures.

Recommendation ITU-R BT.710 – Subjective assessment methods for image quality in high-definition television.

Recommendation ITU-R BT.802 – Test pictures and sequences for subjective assessments of digital codecs conveying signals produced according to Recommendation ITU-R BT.601.

Recommendation ITU-R BT.811 – The subjective assessment of enhanced PAL and SECAM systems.

Recommendation ITU-R BT.812 – Subjective assessment of the quality of alphanumeric and graphic pictures in Teletext and similar services.

Recommendation ITU-R BT.1128 – Subjective assessment of conventional television systems.

Recommendation ITU-R BT.1129 – Subjective assessment of standard definition digital television (SDTV) systems.

Recommendation ITU-R BT.1210 – Test materials to be used in subjective assessment.

Recommendation ITU-R BT.1382 – Assessment of the picture quality of multi-programme services.

Recommendation ITU-R BT.1438 – Subjective assessment of stereoscopic television pictures.

1.2 Other ITU-R documents

ITU-R [1996] Handbook on Subjective assessment methodology in television (Geneva, 1996). ISBN 92-61-05571-0.

2 Documents of the ITU-T and other International Organisations

2.1 Recommendations

ITU-T Recommendation P.800 – Methods for subjective determination of transmission quality.

ITU-T Recommendation P.810 – Modulated noise reference unit (MNRU).

ITU-T Recommendation P.830 – Subjective performance assessment of telephone-band and wideband digital codecs.

ITU-T Recommendation P.861 – Objective quality measurement of telephone-band (300-3 400 Hz) speech codecs. (This Recommendation has been partially replaced by ITU-T Recommendation P.862.)

ITU-T Recommendation P.862 – Perceptual evaluation of speech quality (PESQ): An objective method for end-to-end speech quality assessment of narrow-band telephone networks and speech codecs.

ITU-T Recommendation P.910 – Subjective video quality assessment methods for multimedia applications.

ITU-T Recommendation P.911 – Subjective audiovisual quality assessment methods for multimedia applications.

AES [1996] AES Recommended practice for professional audio – Subjective evaluation of loudspeakers. AES 20. Audio Engineering Society.

EBU [1992] Recommendation R68-1992. Alignment level in digital audio production equipment and in digital audio recorders. European Broadcasting Union. Geneva, Switzerland.

EBU [1994a] Recommendation R22-1994. Listening conditions for the assessment of sound programme material. European Broadcasting Union. Geneva, Switzerland.

EBU [1994b] Doc. Tech. 3276 – Listening conditions for the assessment of sound programme material. European Broadcasting Union. Geneva, Switzerland.

EBU [1997] Doc. Tech. 3286. Assessment methods for the subjective evaluation of the quality of sound programmes. European Broadcasting Union. Geneva, Switzerland.

IEC [1986] Publication 581 – Part 10. High fidelity audio equipment and systems; minimum performance requirements: Headphones. International Electrotechnical Commission.

IEC [1995] Publication 268 – Part 13. Listening tests on loudspeakers. (Draft revision). International Electrotechnical Commission.

NBC [1992] Nordic Recommendation N 12-A. Sound control rooms and listening rooms. Technical Recommendation. Nordic Broadcasting Corporations.

NBC [1992] Nordic Recommendation N 12-B. Studio monitoring loudspeakers. Technical Recommendation. Nordic Broadcasting Corporations.

OIRT [1980] Recommendation 51/1. Permitted noise sound pressure level in recording studios and operational rooms for sound broadcasting and TV. Doc. TK-29-116 International Radio and Television Organization, Prague, Czech Republic.

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OIRT [1990] Recommendation 86/3. Technical parameters of OIRT reference listening rooms. Doc. TK-31-58 International Radio and Television Organization, Prague, Czech Republic.

OIRT [1992] Recommendation 63/3. Formation of listening groups and their working methods. Doc. TK-31-63 International Radio and Television Organization, Prague, Czech Republic.

OIRT [1992] Recommendation 91/2. Subjective assessment of sound recordings. Doc. TK-31-64/1 International Radio and Television Organization, Prague, Czech Republic.

2.2 Other documents

ISO/MPEG [1991] The SR report on the MPEG/Audio subjective listening tests. ISO/IEC JTC 1/SC 2/WG 11 N MPEG 91/010. International Organization for Standardization/Motion Picture Experts Group.

ISO/MPEG [1991] Report on the MPEG/Audio subjective listening tests. ISO/IEC JTC 1/SC 2/WG 11 N MPEG 91/331. International Organization for Standardization/Motion Picture Experts Group.

ISO/MPEG [1994] Report on the MPEG/Audio multichannel formal subjective listening tests. ISO/IEC JTC 1/SC 2/WG 11 N0685 MPEG 94/063. International Organization for Standardization/Motion Picture Experts Group.

3 Other relevant literature

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