

COMMITTEE T1
CONTRIBUTION

Document Number T1A1.5/95-153

STANDARDS PROJECT: Analog Interface Performance Specifications for Digital
 Video Teleconferencing/Video Telephony Service

TITLE: Study Group 12 Activity: Question 22 "Audiovisual
 Quality in Multimedia Systems"

ISSUE ADDRESSED: Video Quality, Multimedia Quality

SOURCE: NTIA/ITS - Arthur Webster

DATE: December 11, 1995

DISTRIBUTION TO: T1A1.5

KEYWORDS: Video Teleconferencing, Video Telephony, Video Quality,
 Subjective Quality, Objective Quality, Multimedia

Study Group 12 Activity: Question 22 “Audiovisual Quality In Multimedia Systems”

A copy of the Q22 portion of the SG12 Working Party 2 Report (yellow version) is attached. It details the contributions received and actions taken.

Highlights

At the September meeting of SG12 the texts for three Recommendations from Q22 were approved to move forward for the approval process. These Recommendations are:

- P.910 (formerly P.VQ) Subjective Video Quality Assessment Methods for Multimedia Applications
- P.920 (formerly P.ITM) Interactive Test Methods for Audiovisual Communications
- P.930 (formerly P.RISV) Principles of a Reference Impairment System for Video

Action Items

1. Mr. Webster presented a Rapporteur's contribution which was the first draft of the new Recommendation: P.AVQ, Subjective Assessment Methods for Global Audiovisual Quality Evaluation in Multimedia Applications. The final version is expected to be ready by May 1996. Those interested in seeing the latest version are advised to download it via anonymous ftp from the following site:

its.bldrdoc.gov
directory: /dist/sg12q22

The documents are in Microsoft Word RTF format (The figures for P.RISV are in separate PostScript files). Anyone with an interest in subjective assessment of global audiovisual quality is asked to look at the document “pavql2.rtf” or whichever more recent version happens to be there.

- Please submit contributions and/or contact Arthur Webster at NTIA/ITS 303-497-3567 or e-mail webster@its.bldrdoc.gov.

- 2. A new question covering objective methods for the assessment of video quality in multimedia systems will be proposed for the next study period. ANSI T1.801.03 should prove to be a good starting point for this work. ANSI T1.801.03 was submitted as a Temporary Document at the SG12 meeting. The Working Party 2 Chair, Mr. Ceruti, asked that it be submitted as a White Document at the next meeting so that it could become part of the permanent record of the Study Group 12.

- We are asking for T1A1's approval to submit the draft American National Standard T1.801.03 as a U.S. contribution to SG12 for Q22. See contribution T1A1.5/95-154.

2.6 Question 22/12 – Audiovisual quality in multimedia services (Mrs. L. Contin, Mr. A. Webster)

2.6.1 Introduction

The wording of Q.22/12 can be found in COM 12-1, p. 21. The goal of the Question is the definition of one-way and two-way opinion test methods and objective test methods to evaluate transmission performance of audiovisual systems.

The standardization of this methodology is urgently required to provide both the users and the providers with criteria and tools to select among the huge amount of new audiovisual (and multimedia) services that are going to be introduced into the telecommunications market.

2.6.2 New contributions

– COM 12-53 Addition of motion correlated impairment artefacts to VIRIS (Bellcore)

This contribution describes a modification to the block distortion impairment and the addition of a signal correlated noise impairment to VIRIS, a Video Reference Impairment System. Methods are described to simulate these two impairments by utilizing scene content and relationships are developed between the VIRIS impairment level and PSNR for two test sequences.

– COM 12-54 Combined A/V model with multiples audio and video impairments (Bellcore)

This contribution reports on additional work on combined audio/video subjective test model for entertainment quality audio/video services. The model was reported previously in COM 12-20 (December 1993) and COM 12-37 (September 1994). This most recent work extends the application of the model to multiple audio and video impairments.

– COM 12-51 ANSI T1 Terms and definitions for video performance studies (United States)

This contribution reports on terms and definitions which are applicable to the digital transport of video teleconferencing/video telephony signals. These terms and definitions are now approved by the T1 Committee in the United States.

The terms are divided in two classes: general terms and impairment terms.

D.76 Comparison of three subjective video quality assessment methods (Royal PTT, Netherlands)

This contribution presents the results of subjective tests carried out at KPN Research and CSELT in the framework of a European Project on Mobile AudioVisual Telecommunication (RACE 2072 -

MAVT). The goal of these tests was the comparison of the performance among absolute category rating, degradation category rating and pair comparison methods.

TD 54 Selections from the ANSI Draft Standard: Digital transport of one-way signals parameters for objective performance assessment (Rapporteurs)

This document, that includes selections of an ANSI Draft Standard, specifies methods of measurement for video performance parameters for one-way video transmission service channels that employ digital transport.

These video performance parameters are defined for the end-to-end transmission quality between the service providers and the end users.

TD 57 Draft ITU-T Recommendation P.VQ: Subjective video quality assessment methods for multimedia applications (Rapporteurs)

This Recommendation is intended to define non-interactive subjective assessment methods for evaluating the quality of digital video images coded at low and medium bit rates.

With respect to the previous version, the most significant changes have been introduced in the following sections: Reference, Terms and definitions, Abbreviations, Scene characteristics, Test methods and experimental design, Annex B - Additional evaluative scales, Annex C - Simultaneous presentation of sequence pairs, Appendix I - Test sequences, Appendix II - Instructions for viewing tests.

TD 58 Draft ITU-T Recommendation P.RISV: Reference impairment system for video (Rapporteurs)

This Recommendation, previously called P.VRU, describes an adjustable video reference system that can be used to generate the reference conditions necessary to characterize the subjective picture quality of video produced by compressed digital video systems.

With respect to the previous version, the most significant changes have been introduced in the following sections: Scope, Abbreviations and definitions, Potential applications for RISV, Noise (in the actual section 5.4), Blocking distortion (section I.2.1), Signal correlated noise (I.2.4.2), VIRIS Program.

TD 56 Draft ITU-T Recommendation P.ITM: Interactive test methods for audiovisual communications (Rapporteurs)

This Recommendation is intended to define interactive evaluation methods for quantifying the impact of coding artefacts and transmission delay on point-to-point or multipoint audiovisual communications.

With respect to the previous version, mainly editorial changes have been introduced.

TD 55 Draft ITU-T Recommendation P.AVQ: Subjective assessment methods for global audiovisual quality evaluation in multimedia applications (Rapporteurs)

This Recommendation is intended to define non-interactive subjective assessment methods for evaluating the global quality of digital video with accompanying audio.

This is the first draft and further studies are required before starting the approval procedure.

TD 49 Liaison statement to Study Group 12, Q.22/12 from SG 1, Q.20/1; meeting May 1995, Subject: Telecommunications Performance Objectives

This liaison statement expresses the desire of SG 1 for SG 12 Q.22/12 to add an additional study item to the existing work programme for treating objective video quality evaluation.

TD 51 Liaison statement from SG 15 (WP 2/19), Subject: Multimedia transmission in the PSTN

This liaison statement is also directed to SGs 1, 2, 8, and 14. It invites SG 12 to participate in meetings in May 1995 and September 1995.

2.6.3 Discussion

An ad hoc meeting for Q.22/12 was held on Thursday 7 September 1995. The purpose of the meeting was to consider editorial and technical changes to the ITU-T draft Recommendations P.VQ and P.ITM.

Mr. Gleiss gave a demonstration on the white pad concerning quality rating scales. Discussion followed resulting in some wording changes to P.VQ. Comments from the email reflector were discussed. A question about the weighting filters for S/N calculation was discussed and later resolved.

Some issues in P.ITM were raised but not resolved until a later meeting.

The discussion of Q.22/12 in WP 2/12 focused on Temporary Documents 56, 57, and 58. One goal of this meeting is to freeze the text in these documents and begin the approval process. A number of editorial and technical changes were suggested which necessitated an ad hoc meeting during the lunch break.

P.VQ

An additional sentence was added to reference alternate methods for PC comparison rating methods. Some additional references were added to the bibliography which included one from Mr. Gleiss and P.80. Also several editorial comments were incorporated into the text. The ad hoc meeting agreed that the text was stable and ready to move forward to the approval process.

P.ITM

An introduction was added to the draft text which states that the work continues in the area of interactive audiovisual testing and that as new knowledge is attained the Recommendation will be revised. Some additional work was done in Appendix I to clarify the examples of tasks and stimuli for conversation. A new appendix was added which further describes the tasks in section I.1. Also several editorial comments were incorporated into the text. The ad hoc meeting agreed that the text was stable and ready to move forward to the approval process.

P.RISV

The title of this Recommendation was changed to: "Principles of a Reference Impairment System for Video". A sentence was added to the summary which states that before an implementation can be recommended validation tests are required. An addition to the introduction was added to the draft text which states that the work continues in the area of reference impairment systems for video and that as new knowledge is attained the Recommendation will be revised. Some additional text was added to clarify the issues involved in the implementation of more than one impairment in a single video sequence. Also several editorial comments were incorporated into the text. The ad hoc meeting agreed that the text was stable and ready to move forward to the approval process.

P.AVQ

The first draft of P.AVQ (Subjective Assessment Methods for Global Audiovisual Quality Evaluation in Multimedia Applications) was presented to the Working Party in TD 55. In the discussion it was agreed to add a section containing Bellcore's work on the AV model presented in COM 12-54. It is

expected that an updated version of P.AVQ will be available at the next SG 12 meeting and that the text can be stabilized at that time.

2.6.4 List of documents

New documents

- COM 12-53 Addition of motion correlated impairment artefacts to VIRIS (Bellcore)
- COM 12-54 Combined A/V model with multiples audio and video impairments (Bellcore)
- COM 12-51 ANSI T1 Terms and Definitions for Video Performance Studies (United States)
- D. 76 Comparison of three subjective video quality assessment methods (Royal PTT, Netherlands)
- TD 54 Selections from the ANSI Draft Standard: Digital transport of one-way signals - parameters for objective performance assessment (Rapporteurs)
- TD 57 Draft ITU-T Recommendation P.VQ: Subjective video quality assessment methods for multimedia applications (Rapporteurs)
- TD 58 Draft ITU-T Recommendation P.RISV: Reference Impairment System for Video (Rapporteurs)
- TD 56 Draft ITU-T Recommendation P.ITM: Interactive test methods for audiovisual communications (Rapporteurs)
- TD 55 Draft ITU-T Recommendation P.AVQ: Subjective assessment methods for global audiovisual quality evaluation in multimedia applications (Rapporteurs)
- TD 49 Liaison STO Study Group 12, Q.22/12 from SG 1, Q 20/1; Meeting May 1995, Subject: Telecommunications performance objectives
- TD 51 Liaison statement from SG 15 (WP 2/19), Subject: Multimedia transmission in the PSTN

Previous documents

- COM 12-34 Development of the Video Performance Reference Model (United States)
- COM 12-35 Modification of Video Reference Impairment System (VIRIS) to improve edge busyness impairment simulation (Bellcore)
- COM 12-36 Preliminary work to include jerky motion impairment in VIRIS1 (Bellcore)
- COM 12-37 Extension of Combined Audio/Video Quality Model (Bellcore)
- D.40 Utility of video reference signals based on additive random noise process (NTT)
- D.41 Additional Glossary/Definition Items for Video Performance Studies (United States)
- D.37 Proposal for a new question on transmission performance in ATM networks (Canada)
- COM 12-21 VIRIS, An Experimental Video Reference Impairment System (Bellcore)
- COM 12-20 Experimental Combined Audio/Video Subjective-Test Method (Bellcore)
- D.15 Tasks for use in assessment of audiovisual connections (Canada, BNR)
- D.22 Proposed attributes of a Video Reference Unit (VRU) and the Need for a Standardized Set of Video Test Scenes (United States)
- D.10 Proposal for the activities related to the Question (CSELT - Italy)

D.11 **Assessment of audiovisual terminal performance in the presence of transmission delay (COMSAT)**

2.6.5 Workplan

SG 12 is asked to begin the Resolution 1 procedure for P.VQ, P.RISV and P.ITM

At the next SG 12 meeting the final draft P.AVQ will be presented.

Contributions on objective measurements have been solicited by the Rapporteurs.

A discussion was held on the desirability of breaking the work into two questions for the next study period. It may be helpful to divide Q.22/12 into two questions dealing with subjective methods and objective methods respectively.

2.6.6 Any other business

A liaison statement will be sent to SG 1 replying to their liaison statement in TD 49. (COM 12-R 23).

No action will be taken to the liaison statement from SG 15 in TD 51. It is felt that this liaison was for information only as far as SG 12 is concerned.