

**Committee T1 Performance  
Standards Contribution**

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**STANDARDS PROJECT:** Analog Interface Performance Specifications for Digital Video  
Teleconferencing/Video Telephony Service (T1Q1-12)  
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**SUBJECT:** ITU-T WP 1/9 Activity on Performance assessment of picture  
quality  
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**SOURCE:** NTIA/ITS  
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**CONTACT:** Arthur Webster (303-497-3567)  
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**KEY WORDS:** video quality, picture quality, subjective, objective,  
performance assessment, multimedia.  
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**DISTRIBUTION:** Working Group T1A1.5  
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## **ITU-T WP 1/9 Activity on Performance Assessment of Picture Quality**

During the week of November 18-21, 1996 WP 1/9 of the ITU-T met in Boulder, Colorado. Study Group 9's mission is concerned with television and sound transmission. Working Party 1 covers video transmission. There are several questions in WP 1/9 that may be of interest to T1A1.5:

**8/9** Transmission time differences between the sound and vision components of a television signal

**9/9** Maintenance and alignment of digital television circuits

**21/9** Laws of addition for impairments associated with all-digital and mixed analogue and digital transmission of television signals

**22/9** Measurement and control of the Quality of Service of digital television transmission contribution and/or distribution networks

**23/9** Development of an assessment aid for MPEG-2 codecs

Considering the interest in the performance aspects of multimedia systems and services is common among several transport methodologies and industry groups an effort is being made to foster cooperative work. WP 1/9 is proposing a joint Rapporteurs' group be formed to facilitate the work on performance assessment methods for picture quality.

By combining the expertise residing in different Study Groups of the ITU work in these areas may be accelerated.

Attached are some documents from the meeting related to this cooperative effort.

**D56** Performance assessment of audiovisual quality

**TD/30-E Rev1** Draft Liaison statement to ITU-T SG12 on cooperation between ITU-T SGs 9 and 12

**TD/45-E** Draft liaison statement to SG 12 on a joint rapporteurs group (JRG)

**TD/43-E** Action plan for subjective and objective assessment methods

**Draft Liaison** from WP 1/9 to WP 11/E of the ITU-R

This contribution is offered for information and as additional background for the contribution T1A1.5/97-106 "Proposed US contribution to ITU-T SG12 - Performance assessment of audio, video, and multimedia quality."

UIT - Secteur de la normalisation des télécommunications  
 ITU - Telecommunication Standardization Sector  
 UIT - Sector de Normalización de las Telecomunicaciones

Commission d'études )  
 Study Group ) **9**  
 Comisión de Estudio )

Contribution tardive )  
 Delayed Contribution )  
 Contribución tardía )

**D 56**

Boulder, 18-21 November 1996

Texte disponible seul. en  
 Text available only in **E**  
 Texto disponible solam. en

Questions : 6/9, 8/9, 9/9, 22/9

Source: USA<sup>1</sup>

Title: PERFORMANCE ASSESSMENT OF AUDIOVISUAL QUALITY

### Abstract

The United States is interested in furthering the timely development of useful and standard methods for performance assessment of audio, video, and audiovisual services and systems. Since both Study Groups 9 and 12 have expertise in these areas, it is hoped that the standardization of assessment methods might be accelerated with cooperation between Study Groups 9 and 12. This contribution proposes that Study Group 9 review the work of Study Group 12 in the areas of performance assessment of audio, video, and multimedia. It further proposes that Study Group 9 send a liaison to Study Group 12 outlining how cooperative work in these areas might be useful to the workplans of both Study Groups.

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## PERFORMANCE ASSESSMENT OF AUDIOVISUAL QUALITY

### Introduction

The United States is interested in furthering the timely development of useful and standard methods for performance assessment of audio, video, and audiovisual services and systems. While the development of subjective methods of quality assessment continues to evolve and improve, there has long been a clear need for objective methods to become available in the areas of multimedia performance assessment. This work is bearing fruit in the ITU-T Study Group 12.

The last study period saw the approval of several Recommendations from Study Group 12 in the area of performance assessment of audio, video, and audiovisual quality:

- P.910 - "Subjective video quality assessment methods for multimedia applications"
- P.920 - "Interactive test methods for audiovisual communications"
- P.930 - "Principles of a reference impairment system for video"
- P.800 - "Methods for subjective determination of transmission quality"
- P.830 - "Subjective performance assessment of telephone-band (300-3400 Hz) and wideband digital codecs"
- P.861 - "Objective quality measurement of telephone-band (300-3400 Hz) speech codecs"

The work of the next Study Period will extend this progress into the area of subjective assessment of overall audiovisual quality by continuing the work on P.AVQ ("Non-interactive one-way test methods for overall audiovisual quality evaluation in multimedia applications"). The work on objective methods of performance assessment for video progressed with the presentation of COM 12-66 ("Selections from the draft American National Standard: - Digital transport of one-way video signals - parameters for objective performance assessment"). COM 12-66 provides the framework and much of the substance required for a comprehensive set of objective measurement methods. An ITU-T Recommendation on the objective performance assessment of video is expected to be approved in the next study period. The approval of P.861 marks the first step in the standardization of objective methods for the quality assessment of audio. This work will be extended during the next study period. The work on objective performance assessment aims to develop metrics that correlate well with human perception and therefore promise to be technology independent.

### Proposal

Considering the expertise of Study Group 9 in the areas of Television and Sound Transmission and given Study Group 9's interest in the areas of quality assessment for these and related services, it is hoped that the standardization of assessment methods might be accelerated with cooperation between Study Groups 9 and 12.

The U.S. proposes that Study Group 9 review the work of Study Group 12 listed above and consider utilizing it, where possible, in the development of its own Recommendations in the areas of performance assessment and quality of service. We propose that a liaison statement be sent to Study Group 12 outlining how such cooperative work in the areas of performance assessment of audio, video, and multimedia might be useful to the workplans of both Study Groups.

**WORKING PARTY 1/9**

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Boulder, 18-21 November 1996

**SOURCE: CHAIR DRAFTING GROUP 7: QUALITY AND MEASUREMENTS**

**TITLE: DRAFT LIAISON STATEMENT TO ITU-T SG12 ON COOPERATION BETWEEN ITU-T  
SGs 9 AND 12**

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**To:** ITU-T Study Group 12  
**Questions:** 10/12, 11/12  
**Origin:** Drafting Group 7, Quality and Measurements  
**Title:** Liaison to ITU-T Study Group 12 (proposed) on cooperation between SGs 9 and 12  
**Submitted for:** For information and action  
**Deadline:** April 21, 1997

**Contact:** Dr. Alina Karwowska-Lamparska  
Rapporteur for Subjective Picture Quality  
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Study Group 9 is in the process of preparing new recommendations concerning the subjective and objective assessment of picture quality. This work is covered in Questions 8, 9, 21, 22, and 23.

8/9 Transmission time differences between the sound and vision components of a television signal

9/9 Maintenance and alignment of digital television circuits

21/9 Laws of addition for impairments associated with all-digital and mixed analogue and digital transmission of television signals

**22/9 Measurement and control of the Quality of Service of digital television transmission contribution and/or distribution networks**

**23/9 Development of an assessment aid for MPEG-2 codecs**

It is hoped that the standardization of assessment methods might be accelerated with cooperation between Study Groups 9 and 12. Study Group 9 currently has a close working relationship with ITU-R WP 11/E and that relationship has proven to be mutually beneficial. We are currently reviewing the P series Recommendations that relate to the assessment of audio, video, and audiovisual quality that were approved by Study Group 12 during the last study period. In order to avoid duplication of effort WP 9/1 will keep Study Group 12 informed of our progress in these areas of quality assessment. Study Group 9 requests that Study Group 12 will update Study Group 9 as to its progress in the areas of performance assessment of audiovisual quality. If possible, an update for the April 1997 meeting of Study Group 9 will be appreciated.

**WORKING PARTY 1/9**

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**Boulder, 18-21 November 1996**

**SOURCE: CHAIR DG 7: QUALITY AND MEASUREMENTS9**

**TITLE: DRAFT LIAISON STATEMENT TO SG 12 ON A JOINT RAPPORTEURS GROUP (JRG)**

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**To:** ITU-T Study Group 12  
**Questions:** 10/12, 11/12  
**Origin:** Drafting Group 7, Quality and Measurements  
**Title:** Liaison to ITU-T Study Group 12 (proposed)  
**Submitted for:** For information and action  
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**Contact:** Dr. Alina Karwowska-Lamparska  
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Considering that Study Group 9 is in the process of preparing new recommendations concerning the subjective and objective assessment of the picture quality of digital cable television systems and since Study Group 12 is also studying related questions

Study Group 9 proposes that a Joint Rapporteurs' Group be formed to facilitate the work. We propose that Dr. Alina Karwowska-Lamparska be the representative from Study Group 9. We hope that Study Group 12 can provide experts to participate in this work.

**WORKING PARTY 1/9**

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Boulder, 18-21 November 1996

**SOURCE: DRAFTING GROUP 7, QUALITY AND MEASUREMENTS**

**TITLE: ACTION PLAN FOR SUBJECTIVE AND OBJECTIVE ASSESSMENT METHODS**

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**Contact:** Dr. Alina Karwowska-Lamparska  
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The following items were agreed to by the Drafting Group 7 (Quality and Measurement) for action:

1. Determine methodologies (subjective and objective) best suited for the quality assessment of television pictures over cable systems.. Contact representatives connected with the MOSAIC project and obtain information about the methods used by them.——
2. Prepare draft recommendation covering subjective assessment of digital cable television systems.
3. Determine what test material is suitable for assessment of digital cable television systems and investigate the measurement methods of criticality of the test sequences. This can be accomplished after reviewing the work of Study Group 11/E of the ITU-R and Study Group 12 of the ITU-T.
4. Analysis of the test results of different laboratories to help determine the best methods for use in digital cable television systems.
5. Determine the best subjective methods for assessing the quality of digital cable television signals in the home viewing environment.
6. Determine the effects on quality assessment of visual images in the presence of accompanying sound images (mono, stereo, and/or surround sound).
7. Determine the best objective methods for the quality assessment of digital cable television systems. At least four contributions will address this issue: D47 (ETR Working Draft 290), COM 12-66 (Study Group 12), and two future contributions from Japan and the United States.
8. Investigate the correlation between subjective and objective methods of picture quality assessment of digital cable television systems.

From Alivia  
To: Send

TO WP11/E

CableLabs.

Liaison from WP 1/9  
Contact: Alivia

SG 9 wishes to inform WPW/E of its intention to form a Joint Rappaport's Group to facilitate work on subjective & objective methods of quality assessment for digital cable television systems.

We have prepared a liaison statement to SG 12 asking for their participation in this Group. SG 9 expects that input for WP 11/E will form a useful part of this Group.

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