COMMITTEE T1

CONTRIBUTION

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STANDARDS PROJECT: All T1A1.5 Digital Video Transmission System Performance Standards Projects

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TITLE: Proposed Framework for Subjective Audiovisual Testing

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1. Introduction

Working Group T1A1.5 is supporting ITU-T Study Group 12 in developing subjective audiovisual testing methods under Question 22/12 which addresses audiovisual quality in multimedia services. A previous contribution from Bellcore, T1A1.5/93-104, describes three basic tests that can be used to examine how perceived audio quality and perceived video quality combine to create a perceived level of composite audiovisual quality. These tests provide a logical and important first step toward understanding the components of subjective audiovisual quality. The present contribution identifies two additional tests that could supplement the three basic tests by providing information about the interactions between perceived audio and video quality. The five resulting tests are summarized in tabular form. Key ideas from this contribution could be integrated with those presented T1A1.5/93-104 to create a proposed U.S. Contribution to ITU-T Study Group 12.

2. Proposed Framework for Subjective Audiovisual Testing

The five subjective audio and video tests illustrated in Table 1 provide a framework for quantifying the mutual interactions between audio quality, video quality, and the effects of these individual components on composite audiovisual quality. All tests would utilize identical test material so that direct comparisons between the tests can be made. Although the following paragraphs use the words “quality” and “impairment” when describing the five tests, no specific subjective test scales or procedures are being proposed at this point. The test numbers were chosen for convenience only and are not intended to indicate a preferred testing sequence.

In test 1, video is blanked and audio is rated. In test 2, audio is muted and video is rated. Test 3 presents the test subjects with both the audio and the video portions of the test material and the test subjects are asked to rate the composite audiovisual quality. The results of tests 1, 2, and 3 might then be analyzed and used to build models for how perceived audio quality and perceived video quality combine to create a perceived level of composite audiovisual quality. Examples of these three tests can be found in T1A1.5/93-104.

In tests 4 and 5, test subjects are provided with both the audio and video portions of the test material, but they are asked to rate only one of the two components. Comparison of the results of test 4 with those of test 1 could result in models for how video impairments impact perceived audio quality. Similarly, a joint analysis of tests 5 and 2 could shed light on how audio impairments impact perceived video quality.

In order to gain the fullest understanding of the interactions between audio quality and video quality in multimedia services, all five tests should be conducted. Such an understanding would be useful for allocating limited communication resources (e.g., bandwidth, processing cycles) between the individual components of a multimedia service. While these tests are necessary, they are not sufficient. In order to understand the impact of audio/video synchronization on perceived quality, tests with controlled levels of desynchronization between the audio and video components must be conducted.

Table 1: Audio-Visual Subjective Testing Matrix

	Only Audio Present	Only Video Present	Both Present
Only Audio Quality Rated	1		4
Only Video Quality Rated		2	5
Composite A/V Quality Rated			3