

DRAFT MEETING RECORD
Video Compression Measurements Subcommittee G-2.1.6
Audio Video Techniques Committee G-2.1
Broadcast Technology Society
Institute of Electrical and Electronics Engineers

Sixth Meeting

Hyatt Regency Hotel on Town Lake
208 Barton Springs Road
Austin, Texas
October 27, 1997

Item 1 - Welcome and Introduction by Interim Chairman, of IEEE G-2.1.6.

Alan Godber called the meeting to order at 10:47 AM.

Item 2 – Approval of Draft Agenda.

Arthur Webster was scheduled to give a report on the ITU meeting in Turin, Italy. However, due to flight delays he was not expected to arrive until 3 PM. David Fibush agreed to substitute his report on the ITU Joint Experts meeting in Turin in Item 5. Arthur Webster's presentation will be included when he arrives.

Item 3 – Review and Approval of Minutes of the Previous Meeting #5, August 4th, 1997

It was agreed the long version of the minutes would be the official version. The minutes were approved as submitted.

Item 4 – Matters Arising from the Minutes

Several members requested an action item list be included in the minutes. Doug Lung asked that they be clearly identified during the meeting. It was also suggested that periodic email reminders be sent to those responsible for action list items.

Item 5 – Report of the Meetings of ITU Joint Rapporteurs Group in Turin, Italy – David Fibush

David Fibush distributed *Report on the Experts meeting on subjective and objective video quality assessment, held at CSELT in Turin, Italy, October 14-16*, David Fibush, October 16, 1997 to the subcommittee. (Doc. G-2.1.6/57, 27 October, 1997)

The Turin meeting was not an official ITU Joint Rapporteurs Group meeting because Study Group 11 could not participate. Consequently, it was called an “Experts meeting”, and experts from Study Group 9, Study Group 12 and WP 11E attended. Each item in the report was discussed.

Purpose of the tests

Criteria for acceptance

In response to the report’s statement that “A ‘scene’ may be a portion of a sequence considering the possibility of a cut between two cameras,” a comment was made that at least one cut-in was needed.

Fairness of the test

After this portion of the report, there was a discussion concerning the validity of accepting software or simulations from proponents instead of actual systems for the independent laboratory testing. There were concerns that the hardware implementation might not work, although the simulation did. One concern was that non-real-time simulations might not expose the limitations of the systems. A lengthy discussion of what defined “real-time” and whether a method should be considered “real-time” if there was latency followed. Definitions of “real-time” were suggested. The final suggestion was to say a system is “real-time” if “sampling is sufficient to portray all real-time events of interest.”

Test Plan for Subjective Tests

Pre-processing for Alignment

Schedule

Objective Data Analysis

Scene selection

Although criticality measurements could be used to help select scenes, experts like Phil Corriveau from CRC will probably end up doing the selection.

Subjective Picture Quality Assessment

The proposed use of non-expert viewers instead of expert viewers or a mixture of the two was discussed.

Once it was reported that the Expert’s Group had agreed on a viewing distance of 5H for the tests, several committee members suggested shorter distances were needed. It was felt that at this distance viewers would miss artifacts. A distance of 3H, the same as that used in the high-definition viewing tests, was recommended.

Audiovisual Test Methods

Break for Lunch from 12:20 PM to 1:48 PM

The subcommittee agreed to discuss these points for submission to the ITU Joint Rapporteurs Group:

- Secrecy – allow people to see the images but not have electronic copies of them.
- The validity of using a software simulation for an algorithm that might not be practical in implementation.
- Expert viewers may be preferred over non-expert viewers for some of the testing..
- Set the viewing distance for the subjective tests at three picture heights instead of heights of 5H, 6H or 7H.

Because some of the issues coming up here might relate to task force items, discussion was deferred until after those items.

Item 6 – Report of Task Force on Preparation of Scope for Committee Work – Chair, Leon Stanger

It was noted that Alan Godber was going to contact IEEE ACM for the name of a liaison person and Leon Stanger was going to work in “objective” in Item 8.

6.1 Further Discussion and Action.

There was no additional discussion.

[ACTION ITEM] Leon Stanger will take care of posting Version 1.0 of the Scope for Committee Work on the Joint Rapporteurs Group email reflector.

Item 7 – Report of Task Force on Constraints (Items not to be part of Image Quality Measurement) – Chair, William Meeker.

This item was dropped. The work is done and it has moved on to the ITU experts group.

7.1 Further Discussion and Action.

There was no additional discussion.

Item 8 – Report of Task Force on Timetable, Chair, Leon Stanger

Leon Stanger distributed *Report of the Schedule Task Force to the Compression and Processing Subcommittee G-2.1.6*, by Leon Stanger, October 21, 1997. (IEEE Doc G-2.1.6/58, 27 October 1997.)

Initial discussion of this report focused on selected proponents’ willingness to make their algorithms available to other manufacturers. There was general agreement that any algorithm selected for a standard should be available for licensing.

The method for selecting a system and creating a standard was discussed. There was concern about the wording in Event 4 of the report that involved selection of a winning system. There was some agreement that ITU could fill in the work up to Event 4. If more than one system was selected the two could be considered separately or combined. It was noted that we need to come up with a draft standard, which we can’t have until companies agree to license their methods. At that point, we would hope to have multiple companies interested in building the implementation.

Leon Stanger asked what the effect on the industry would be if this committee did nothing. Are we enhancing or slowing the effort? Most agreed a standard was needed and if we did not participate there could be problems with multiple standards or ITU could come up with a standard we did not agree with. It was also noted that this committee provides a legal way to bring users and industry together. We should continue to provide input to the ITU groups.

Leon Stanger asked for comment on whether the method chosen will survive for a considerable time or whether the rate of innovation will supersede the committee's efforts within in a few years. There was general agreement a measurement standard was needed, although we must be ready to improve and refine the work over time. The combined IEEE and ITU efforts are a start. While there was some concern our efforts are too late, it was also noted the timing for getting agreement on a standard was good because there were not yet many viable picture quality measurement systems in the marketplace. If we wait two years, it may be too late as more manufacturers bring systems to market.

8.1 *Further Discussion and Action*

Leon Stanger concluded the discussion would suggest the nine steps outlined in his report were correct. It also appears Events 1-4 are being done through ITU, although it was noted we provide views from potential users and can provide ideas and even items such as test materials and perhaps facilities to the effort.

[ACTION ITEM] Leon Stanger will work with his team and will try to set out a schedule based on the guidelines discussed.

Break from 3:21 PM to 3:54 PM

Item 5A (rescheduled) – Report of the Meetings of ITU Join Rapporteurs Group in Turin, Italy – Arthur Webster

Arthur Webster distributed *Results from the Experts meeting on subjective and objective video quality held in Turin, Italy, October 14-16, 1997*, (T1A1.5/97-618) Arthur Webster, NTIA/ITS, October 27, 1997. (IEEE Doc. G-2.1.6/59, 27 October 1997.) [Some of the information was presented in David Fibush's report earlier in the day and is not repeated in this record. Refer to the printed report.]

Criteria of Acceptance

Fairness of test

Arthur Webster reported that many people at the Experts meeting agreed that if manufacturers knew what the test scenes or HRCs were, it wouldn't be a fair test.

The need for secrecy was discussed by the subcommittee. If manufacturers knew what the scenes and HRCs (Hypothetical Reference Circuits) would be, they could design their systems to put out the correct results for those specific scenes. Arthur Webster commented that secrecy seemed to be the best compromise to keep out unscrupulous people.

The type of test scenes selected and other issues are being discussed by email. The Chairs of the various Expert ad-hoc groups are coordinating the email discussions.

Test Plan for Subjective Test

The discussion about the proper viewing distance for the subjective tests that started with David Fibush's report continued here. Again, several people suggested a distance of 3H was more appropriate for seeing the artifacts.

Arthur Webster listed the members of the test plan ad-hoc groups:

Ad Hoc Group Members Turin October 14-16, 1997

Subjective Test Plan – Phil Corriveau, CRC & Alex Schertz, IRT, co chairs.

Laura Contin – CSELT

Arthur Webster – NTIA

Stephane Pefferkorn – CCETT

Takahiro Hamada – KDD
 Massimo Visca – RAI
 Jeff Lubin – Sarnoff
 Dominique Pascal – France Telecom / CNET
 John Beerends – KPN, the Netherlands

Objective Test Plan (including acceptance criteria) – J. Beerends and Mihir Ravel, co chairs

Arthur Webster – NTIA, USA
 Michael Brill – Sarnoff, USA
 Phil Corriveau – CRC, Canada
 Takahiro Hamada – KDD, Japan
 Laura Contin – CSELT, Italy
 Dominique Pascal – France Telecom/CNET, France
 Stefan Winkler – EPFL, Switzerland
 Stephane Pefferkorn – CCETT, France

Video Classes

Arthur Webster described the changes made by the video classes ad-hoc group. The range of TV2 and TV3 classes was changed and agreed to. Contribution quality was extended to 18 Mb/s and proprietary coding algorithms were allowed.

Subjective Test Plan

His report that KDD had two subjective tests that correlated to 0.91 led to a discussion of what amount of correlation was appropriate for the tests. It was noted that the T1A1.5 subjective tests conducted by GTE Labs, NTIA/ITS, and Delta Information Systems had inter-lab correlation coefficients ranging between 0.95 and 0.97. Because the subjective tests are the yardstick against which the objective measurement systems will be evaluated, if the subjective test's correlation is not good enough we should find out why and improve the tests. While it was felt a correlation of 0.91 was not good enough, even the best subjective tests will have their limits. Alan Godber suggested that the experience gained in the T1A1.5 testing be submitted to the subjective test ad-hoc group.

Although Item 5, Page 6 of Arthur Webster's *Report* defined one test scope level "to replace subjective tests", there was general agreement that a complete replacement of subjective tests is not possible. While subjective tests have their limitations, it does have value in providing a measure of absolute intrinsic quality. One of the limitations mentioned was the compression of results if the video have too wide a range of quality. It was suggested that Item 5 either be reworded and/or combined with Item 2.

The nature of the test scenes was debated. Quality changes from scene to scene. Using very different, complicated scenes for the testing will make it harder to analyze the results. Although a scene of constant complexity is easier to analyze, encoder systems react differently to changes in complexity depending on the buffer model used so some changes have to be included. In those cases, the change would be the dominant factor in the measurement. Care must be taken, however, that the change doesn't distract the viewers during the subjective testing.

5.1A Further Discussion and Action

Chair Alan Godber asked for a consensus on what comments in each of the five topics discussed earlier should be submitted to the ITU group. It was decided that two or three people would wordsmith the results of the discussion and submit them to the Subjective Test Plan and Testing Labs ad-hoc groups. It was also agreed that these items would be submitted as topics for discussion and not the consensus opinion of this subcommittee.

[ACTION ITEM] Alan Godber, Walt Husak, Al Morton and David Fibush will put together comments for the group. Doug Lung will supply information from the minutes.

The discussion is summarized in *Comments From Those Present At Meeting Of IEEE G-2.1.6 Subcommittee On Video Compression Measurements In Austin, Texas, On October 27th, 1997* to ITU Video Quality Experts Group (Turin Experts Group), Alan S. Godber, Chairman of G-2.1.6 (on behalf of those attending the Subcommittee meeting in Austin, TX on October 27th, 1997), November 12, 1997. (IEEE Doc G-2.1.6/62.)

Item 9 – Report of Task Force on Compression Measurements Information Gathering – Char, Bill Zou

Bill Zou was unable to attend the meeting. Chair Alan Godber summarized the report. Zou sent email attempted to contact proponents of the various systems and see if they wanted to make a presentation to our committee. John Beerends has not replied. C. J. van den Branden Lamberct answered he would be happy to supply information beyond that presented at the T1A1.5 meeting in Kansas City in August.

David Fibush reported he had copies of the IRT and Tektronix tests posted on the IEEE G-2.1.6 web site. He distributed *IRT/Tektronix Investigation of Subjective and Objective Picture Quality for 2-10 Mbit/sec MPEG-2 Video: Phase 1 Results*, A. Schertz, Sound and Picture Processing Group, Institut fuer Rundfunktechnik (IRT), N. Franzen, J. Lu, M. Ravel, Information Technologies Group, Tektronix Measurement Division, October 6, 1997. (IEEE Doc. G-2.1.6/60, 27 October 1997.)

9.1 Further Discussion and Action

There was no further discussion.

Item 10 – Report of Task Force on Test Imaging Materials – Chair, David Fibush

David Fibush proposed a meeting to determine if the downconverted scenes are usable.

10.1 Further Discussion and Action

[ACTION ITEM] David Fibush suggested meeting at 10 AM Tuesday, November 4. Details will be posted on the email reflector. The purpose of the meeting would be to determine whether down-converted scenes have sufficient quality.

Item 11 – Where Measurements Take Place in a Broadcast Chain – Leon Stanger

This item was postponed.

Item 12 – Discussion of Compression Measurement Methodologies

This item was postponed.

Item 13 – Any Other Business

No other business was presented.

Item 14 – Date(s) of Future Meeting(s)

The committee agreed to a tentative date of Friday, January 9 or Monday, January 26, depending on when the ITU work is done. Alan Godber will publish both dates for now.

[ACTION ITEM] Walt Husak will look into a preferred hotel for those attending.

Rick Redford made a motion to adjourn. Walt Husak seconded it.

The meeting was adjourned at 6:39 PM.

Submitted by:

H. Douglas Lung
Secretary

APPENDIX "A"

List of Documents Distributed

27 October 1997

Draft Agenda - IEEE Compression and Processing Subcommittee G-2.1.6 Sixth Meeting, Monday, October 27th, 1997, Alan Godber, Chairman, 27 October 1997.

Draft Meeting Record, G-2.1.6, Compression and Processing Subcommittee, Meeting #5, August 4, 1997, Ritz Carlton Hotel, 401 Ward Parkway City, Kansas, Missouri, Doug Lung, Secretary, Doc. G-2.1.6/55, 27 October 1997.

Draft Meeting Record (edited summary), G-2.1.6, Compression and Processing Subcommittee, Meeting #5, August 4, 1997, Ritz Carlton Hotel, 401 Ward Parkway City, Kansas, Missouri, Doug Lung, Secretary, Doc. G-2.1.6/56, 27 October 1997.

Report on the Experts meeting on subjective and objective video quality assessment, held at CSELT in Turin, Italy, October 14-16, David Fibush, October 16, 1997, Doc. G-2.1.6/57, 27 October 1997.

Report of the Schedule Task Force to the Compression and Processing Subcommittee G-2.1.6, Leon Stanger, October 21, 1997, Doc G-2.1.6/58, 27 October 1997.

Results from the Experts meeting on subjective and objective video quality held in Turin, Italy, October 14-16, 1997, (T1A1.5/97-618) Arthur Webster, NTIA/ITS, October 27, 1997, Doc. G-2.1.6/59, 27 October 1997.

IRT/Tektronix Investigation of Subjective and Objective Picture Quality for 2-10 Mbit/sec MPEG-2 Video: Phase I Results, A. Schertz, Sound and Picture Processing Group, Institut fuer Rundfunktechnik (IRT), N. Franzen, J. Lu, M. Ravel, Information Technologies Group, Tektronix Measurement Division, October 6, 1997, Doc. G-2.1.6/60, 27 October 1997.

Report of the Task Force Meeting held at the ATTC in Alexandria, VA, September 22nd, David Fibush, Tektronix, Inc., September 30, 1997, Doc G-2.1.6/61, 27 October 1997.

APPENDIX "B"
ATTENDANCE RECORD
27 October 1997

Name	Affiliation	Telephone	Fax	E-mail
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