

Institute of Electrical & Electronics Engineers
Broadcast Technology Society
G-2.1 Audio/Video Techniques Committee
G-2.1.4 VIDEO DISTRIBUTION MEASUREMENTS SUBCOMMITTEE

MEETING MINUTES

United States Department of Commerce
National Telecommunications Information Administration
ITS-N3, 325 Broadway, Room 1107
Boulder, Colorado 80303-3328
Monday, March 16, 1998, 8:30 AM - 12:00 Noon, MST

ATTENDEES

<u>Name</u>	<u>Affiliation</u>	<u>Location</u>
Dan Baker	Tektronix	Beaverton, OR.
Dick Bobilin	CCC	Durham, NC.
Randy Bloomfield	NTIA/ITS	Boulder, CO.
Larry Brown	Ameritech	Hoffman Estates IL.
Dave Fibush	Tektronix	Beaverton, OR.
Alan Godber	Consultant	Milltown, NJ.
Doug Lung	Telemundo	Hialeah, FL.
Aidan Moore	Genum	Burlington, ON.
Al Morton	AT&T	Holmdel, NJ.
John Libert	NIST	Gaithersburg, MD.
Rick Redford	NBC	New York, NY.
Leon Stanger	DirectTV	El Segundo, CA.
Dick Streeter	CBS	New York, NY.
Pat Tweedy	GTE Labs	Waltham, MA.
Arthur Webster	NTIA	Boulder, CO.

1. The meeting was called to order by the Interim Chair, Rick
2. Redford, at 8:30 AM. In lieu of a secretary for the meeting,
3. Messrs. Fibush and Lung agreed to furnish their meeting notes, which the Chair will check with the audio transcript, and publish as the draft minutes.

4. After each participant was introduced, the draft agenda was approved without change, as was the draft meeting minutes from Alexandria on January 26, submitted by Mr. James O'Neil. The Chair noted that these documents had been on the Subcommittee's Web Site for review for at least a week.

5. Instructions for subscribing to, and sending comments to the Subcommittee's E-mail Reflector were reviewed. A list of current subscribers was circulated. The Chair noted that participants and members not on the reflector are at risk of missing important information and announcements.
- 6a. The Chair asked Mr. Moore, Chair of the P205 Task Force, to report on the revision of the Draft Standard for Measurement of Luminance Signal Levels. Mr. Moore had prepared a table of Comments Regarding P205 (the draft of 02 June 97 has been balloted and approved, however, the IEEE requires that any negative comments from balloting be discussed).
- 6b. Mr. Neil Neubert, a voting member of this Subcommittee, had previously criticized the draft in a very general way. Mr. Neubert was contacted in preparation for this meeting, but was attending other committee meetings, did not have a copy of the draft, and therefore could offer only more general comments.
- 6c. Mr. Streeter suggested that Mr. Neubert be contacted again to ascertain his willingness to provide more detailed objections in written form, but for the Subcommittee to deal with such abstract comments is not possible. Mr. Moore allowed that in his opinion, the document is reasonably readable and precise. Mr. Fibush noted that another two months has passed without further details of Mr. Neubert's objections, and that if Mr. Neubert seriously would like some changes, we must have the details. Mr. Godber concurred.
- 6d. Mr. Moore said the deadline for submitting the proposed standard with editorial revisions to the IEEE Standards Board is May 8; following that is August 7, so, since NAB is over April 11, the end of April seems a reasonable deadline. He will send Mr. Neubert a package containing the latest editorial revision of P205 (March 11, with subsequent editorial alterations, including the results of this meeting). The Subcommittee voted unanimously that the deadline for any further objections be April 30.
- 6e. Mr. Fibush suggested that absent further comments, the proposed standard should be submitted by May 8. Mr. Moore noted that a few "technical" changes had yet to be made. Mr. Fibush asked if these changes were not really editorial, and Mr. Moore agreed that none of the remaining alterations would require re-balloting.

- 6f. The Chair noted that there were several comments from Mr. Lilly which were sent on the Subcommittee's E-mail Reflector, which are not on the Mr. Moore's table. A copy of the editorially revised (March 11) draft standard was distributed. The Chair then asked Mr. Godber (Chair of the parent G-2.1 Audio/Video Techniques Committee) for clarification of the procedure. He indicated G-2.1 has had an opportunity to review the draft, and that at this juncture, the Task Force Chair (Mr. Moore) should review any minor corrections with the IEEE Standards Board. If any substantive issues arise, these should be brought to the attention of the full Subcommittee.
- 6g. Mr. Streeter remarked that we should focus on substantive issues, rather than the editorial formatting. Mr. Baker responded to Mr. Lilly's objection to "white paper" style by saying that he used IEEE Standard 511 (Measurement of Linear Waveform Distortion) as a guide. The Chair said that whoever takes the time to draft the standard has certain leeway in setting the style. Mr. Baker remarked that he has found that a strictly normative style is often more difficult to understand. Messrs. Godber and Streeter concurred.
- 6h. Mr. Lung said that he preferred the "white paper style." Mr. Moore noted that while Mr. Neubert was arguing that the document was difficult to understand, Mr. Lilly believes that it is too informative. The Chair remarked that it sounds like we have reached the middle ground. Mr. Godber said that there has traditionally been argument over the issue of explanatory information.
- 6i. There followed a review of Mr. Lilly's comments, many of which were quite helpful, and improved the document, however, no substantive changes were made to the draft; all the changes made were deemed to be editorial in nature. Nevertheless, the Subcommittee agreed to have one more look at the draft before submitting it to the Standards Board. Mr. Moore will examine the draft for compliance with the IEEE Style Manual.
- 6j. Significant discussion: Certain definitions called into question have already been revised. Provision for monochrome signals will be made, however, the luminance filter will still be required for consistency in measurement, since it attenuates higher frequencies. This revision of Std. 205 now intentionally defines 140 IRE units as 1-volt peak-to-peak. One percent measurement accuracy is believed achievable. The graticule shown and calibration signal are only examples; this standard is not meant to define them. All the figures will be

appropriate titles. Component values specified are theoretical optimums; it is the designer's responsibility that the filter comply with the mask of Fig. 3.

8. Mr. Michel Poulin was unable to attend this meeting, however, he submitted a written argument for a standard for swept frequency response measurement, which is posted on the Subcommittee's web site. Mr. Poulin contends that an accurate procedure for assessment to better than 0.05 dB should be standardized to evaluate signal integrity through cascaded analog/digital conversions. ITU-R BT.601 specifies pass band tolerances which necessitate measurements to this accuracy. Discussion will be encouraged via the E-mail Reflector, but was deferred in committee until Mr. Poulin can be present.
11. The Chair took a moment to note that MS Word 6.0 had been previously designated as the preferred means of circulating documents. Owing to the increased use of figures and the size of some texts, it has become necessary to use other formats, including compression. Messrs. Fibush and Godber voiced concern about the loss of data using .PDF files. Mr. Lung noted that the latest version 3.01 of Adobe Acrobat has corrected many previous problems.
10. Comments from Mr. Lilly on the revision of IEEE Std. 511, "Measurement of Linear Waveform Distortion" were distributed. The Chair asked Mr. Lung to contact Mr. Lilly for an electronic version which can be posted on the web site. Because of the extensive work on projects P205 and P1521 today, review of these comments was deferred, however discussion on the E-mail Reflector will be encouraged. Mr. Streeter pointed out the advisability of assigning document numbers; the Chair acknowledged this omission.
- 7a. Project number P1521 has been assigned to the Proposed Measurement Standard for Video Synchronization Jitter and Wander. Mr. Moore reported that the first draft dated 7/30/97 was revised on 1/10/98. In addition to the draft standard, two related documents were distributed: "Jitter and Wander Draft FAQs," by Dan Baker, and "Measuring Wander in Video Distribution Systems," by Tom Tucker.
- 7b. At the last meeting, in Alexandria, some members asked what material could be moved to the appendix? The draft standard has been posted on the web site for some time, but received no

comments. At the suggestion of the Chair, Mr. Moore agreed that a message could be sent to members and participants of this Subcommittee soliciting comments. Mr. Fibush mentioned that it has also been distributed to the SMPTE PT20 as a liaison document. The chair requested that SMPTE be apprised of revisions as they are drafted.

- 7c. Mr. Fibush suggested that a timetable be established for this project. Mr. Godber concurred that an early date be set to ballot the draft so that, absent much negative reaction, the process can move forward. Mr. Streeter said that any issues should be raised before the next meeting to save time in committee. Mr. Fibush suggested that the balloting process should be initiated after the Subcommittee's next meeting. There was general agreement that this would provoke interested parties to comment, and that a deadline for comments of four to six weeks prior to the next meeting should be set to allow for discussion.
- 7d. Mr. Baker presented the items in his Frequently Asked Questions (FAQs) handout, which he had prepared from comments of this Subcommittee and his colleagues at work, with additional explanation of each. The draft standard describes conceptual methodologies, not specific circuitry or equipment interconnection. This standard will be applicable to MPEG transport stream program system timing clocks, not just analog or serial digital video.
- 7e. Mr. Baker said the demarcation frequency between wander and jitter varies according to the typical drift rate and peak jitter. For conventional television, a value of 1 Hz might be better than the 10 Hz used by the telephone companies, and 0.01 Hz for MPEG transport streams. Presently, it is not possible to obtain consistent measurements of jitter because off-the-shelf equipment has so many variables. For instance, the demodulator in a vectorscope may have very different characteristics from that of a picture monitor or tape machine.
- 7f. This standard may not be appropriate for telco SONET circuits because it just addresses the effects on video. The problem is that the phone companies have no standards in this regard for video. Mr. Fibush asked why MPEG has such a tight frequency drift requirement (10 ppb) when the frequency tolerance is so loose (30 ppm)? Mr. Baker agreed that this was curious, but is in the specifications. Mr. Fibush said he will enquire about this.

- 7g. This was followed with a demonstration of such measurements. Mr. Baker showed three methods of jitter measurement emphasizing the need for a third order loop. Also demonstrated was a tape showing recorded color phase errors due to response of the record VTR to input wander. The discussion and demonstration was very helpful for those present to understand the topic.
9. Discussion of Work on Existing Std. 206, "Measurement of Differential Phase and Gain" - Mr. Meeker. Due to the lateness of the hour, work on this agenda item was deferred until the next meeting.
12. No new business was tendered.
13. The date and location of the next meeting (probably in July) will be announced shortly via the Subcommittee's web site and E-mail reflector. The meeting was adjourned at 1:08 PM, MST.

LIST OF DOCUMENTS DISTRIBUTED

G-2.1.4/031698-001	Meeting Agenda
G-2.1.4/031698-002	Meeting Record, 26 Jan 98, Alexandria
G-2.1.4/031698-003	Participation List, G-2.1.4 Subcommittee
G-2.1.4/031698-004	P205 Draft, Revised 02 Mar 98
G-2.1.4/031698-005	Table of Comments Regarding P205
G-2.1.4/031698-006	E-mail on P205 from Neil Neubert, 08 Mar 98
G-2.1.4/031698-007	E-mail on P205 from Bruce Lilly, 02 Feb 98
G-2.1.4/031698-008	P1521 Draft, Revised 10 Jan 98
G-2.1.4/031698-009	Jitter/Wander Tutorial by Tom Tucker
G-2.1.4/031698-010	Jitter and Wander Draft FAQ's by Dan Baker
G-2.1.4/031698-011	Comments on Std. 511 by Bruce Lilly
G-2.1.4/031698-012	Freq. Response Measurements by Michel Poulin