

**Minutes of TC-10 Waveform Recorder Subcommittee Meeting of
October 13 and 14, 2004 in Boston , Massachusetts**

Attendance:

Steve Tilden	Texas Instruments
Tom Linnenbrink	Q-Dot
Bill Boyer	Sandia National Laboratories
David Bergman	NIST
Jerry Blair	Bechtel Nevada
Fang Xu	Teradyne
Pasquale Daponte	University of Sannio
Bob Graham	Sandia National Laboratories

1. Agenda

Bill Boyer distributed an agenda by email prior to the meeting. It is attached to the minutes.

2. PAR Extension

The PAR for the project was extended by four years – to September 2008. However, the intention is to finish before then.

3. Draft Status

Not many changes were made. Bill sent out new versions of clauses 4, 7, 8, 9, and 10. Appendix I will remain as action item (Blair).

3. Review of Assignments

The material is presented here in order by the sections of the draft as opposed to the order in which it was covered in the meeting.

Clauses 4.2.3, 4.2.4. Connecting Signal Sources. Boyer will include Tilden's writeups submitted last March. **DONE 1/5/05**

Clause 4.3 Equivalent Time Sampling. Figure 2 is still incorrect. Sol Max has made a corrected figure that must be used. Blair will add the equivalent time sampling method presented at the last IMTC. (Max, Blair)

Clause 4.4 Blair will rewrite to keep same meaning but use correct terminology. (Blair)

Clause 4.5.7 – Nonidealities of sinewave sources. Corrections made due to the previous review were made and put on the web page too late for anyone to look at. The new version was reviewed at the meeting, with one additional action item: Check if the 2 dB correction in the section on measuring wide-band noise should be before the subtracting of the two noise floors. (Blair)

Clause 4.6.3.2 Minor changes were completed. (Boyer)

Clause 4.6.3.3 Minor changes were completed. (Boyer)

Clause 4.7.3.1 Cable Effects. Moved from 4.7.5 and expanded. DONE 1/10/05.

Clause 4.7.3.1 Cable Effects. Combine the above into 4.2.3 (Connecting Signal Sources) if possible. (Blair)

Clause 4.7.3.2 Aliasing Errors. The notes from the meeting say that this has been moved to clauses 9 and 10. It was removed from clause 4 but does not appear in the clauses 9 and 10 that are on the web. (Boyer)

Clause 4.7.5 Errors associated with equivalent time sampling. Bergman to start writing this section. Blair will help if needed. (Bergman)

Clause 7.1 Need to add INL as a function of code bin. (Sol Max)

Clause 7.1.1 Will add: "Note that transition levels are undefined if the recorder is non-monotonic." (Boyer)

Clause 7.4 Minor fixes were completed.

Clause 7.6 Resolve issue with static and dynamic hysteresis. (Sol Max)

Clauses 7.7.1.1 and 7.7.1.2. These need to use notation and terminology (relating to FFTs) that is identical to that in clause 4.4. Look at this after 4.4 is rewritten. Also, consider adding a 3rd method corresponding to available software. (Blair)

Section 8.

Quite a few changes were made to the draft during the meeting – primarily changing the definition of noise to not include harmonic distortion. What was previously called noise is now called noise and distortion (NAD).

Clause 8.x DC Effective Bits. Fang Xu will write. (Xu)

Clause 8.1.3.1 Rename to "Test method for SNR using coherent sampling." (Boyer)

Clause 8.1.3.x. A noncoherent-sampling test method for SNR would be useful. (Blair)

Clause 8.1.5 Change equations 57 through 59 to replace Q_{eff} with its definition. The equations are simpler that way.(Blair)

Clause 8.2 ENOB. Write new test method based on recent publication of Kollar and Blair. (Blair)

Annex D. Reinsert equations. (Boyer, Done 1/5/05)

4. Meeting Adjourned

Agenda

Agenda for Waveform Recorder Subcommittee Meeting
October 13, 14, 2004

1. Introductions
2. Review of status of the draft
3. Review of status of assignments per minutes of March 2004 meeting:
 - Annex I, Section 4.5.6 Presentation of Sinewave data – to be written (Jerry Blair)
 - Section 4.5.7 add minor comments (Jerry Blair)
 - Section 4.6.3.2. Minor fixup. (Bill Boyer)
 - Section 4.6.3.3. Fix figure fonts (Bill Boyer)
 - Section 4.7.5 delete (Bill Boyer)
 - Section 4.7.6 move to equivalent time sampling section (Jerry Blair)
 - Section 4.7.3.1 Blair to add more material. Boyer to move to Connecting Signal Sources
 - Section 4.7.3.2 Move to more appropriate sections and fix references (Boyer)
 - New Section 4.7.7 Test equipment performance – remove (Boyer)
 - Old Section 4.7.7 make sure all material moves to new sections (Boyer)
 - 9.5.2 Fix references to other sections (Boyer)
 - Section 7.1 Add discussion of INL curve and rms INL (Sol Max)
 - Section 7.1.1 mention monotonicity (none)
 - Section 7.4 note fit to straight line. Fix captions (Boyer)
 - Section 7.6 Resolve issue with static and dynamic hysteresis (Sol Max)
 - Section 7.7 Change definition text, remove test details (Boyer)
 - Section 7.7.1 minor wording changes (Boyer)
 - Section 7.7.1.1 rewrite to simplify (Jerry Blair)
 - Section 7.7.12 .Equation numbering, other minor edits (Boyer)
 - Section 8. Redefine noise to not include harmonic distortion (Boyer)
5. Other business
6. Detailed review of draft
7. Review action items