

Accredited Standards Committee*
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Reply to: John Lohmeyer

To: T10 Membership
From: Ralph Weber & John Lohmeyer
Subject: Parallel SCSI Working Group Meeting -- April 26-27, 2000
Colorado Springs, CO

Agenda

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 - 4.4.5 Details of test set-up used by Quantum for Ultra320 data (00-214) [Evans]
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 - 4.5 Other SPI-4 Physical Topics
 - 4.5.1 Precompensation and test measurements (00-194) [Manildi]
 - 4.5.2 Comments on adaptive filtering for Ultra320 SCSI (00-196) [Brown]
 - 4.5.3 Expander Topics (00-199) [Ham]
 - 4.5.4 The zero offset problem for receiver equalization (00-201) [Bridgewater]
 - 4.5.5 Next Meeting Testing Data [Penokie]
 - 4.5.6 Should QAS be obsoleted in SPI-4? [Elliott]
 - 4.6 Protocol
 - 4.6.1 Remove Data Groups from F-160 [Penokie]

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- 4.6.2 Flow Control & Read Streaming (00-142) [Lamers]
- 4.7 Receiver Issues
 - 4.7.1 Receiver Specifications [Ham]
 - 4.7.2 Calculated Signal Losses [Aloisi]
- 5. Expanders and Domain Validation Topics
 - 5.1 SCSI out of band communications method (99-213) [Petty]
- 6. New Business
 - 6.1 SPI-3 Public Review Comment #1 (00-219) [Penokie]
- 7. Meeting Schedule
- 8. Adjournment

Results of Meeting

1. Opening Remarks

John Lohmeyer, the T10 Chair, called the meeting to order at 1:00 p.m., Wednesday April 26, 2000. He thanked LSI Logic for hosting the meeting.

As is customary, the people attending introduced themselves and a copy of the attendance list was circulated.

2. Approval of Agenda

The draft agenda was approved with no changes.

During the course of the meeting, the following agenda items were added/revised:

- 4.4.10 Precompensation and test measurements (00-194) [Manildi]
- 4.5.5 Next Meeting Testing Data [Penokie] <deleted>
- 4.5.6 Should QAS be obsoleted in SPI-4? [Elliott]
- 4.6 Protocol
 - 4.6.1 Remove Data Groups from F-160 [Penokie]
 - 4.6.2 Flow Control & Read Streaming (00-142) [Lamers]
- 4.7 Receiver Issues
 - 4.7.1 Receiver Specifications [Ham]
 - 4.7.2 Calculated Signal Losses [Aloisi]

3. Attendance and Membership

Attendance at working group meetings does not count toward minimum attendance requirements for T10 membership. Working group meetings are open to any person or organization directly and materially affected by T10's scope of work. The following people attended the meeting:

Name	S	Organization	Electronic Mail Address
Mr. Lawrence J. Lamers	P	Adaptec, Inc.	ljlamers@ieee.org
Mr. Vincent Bastiani	A#	Adaptec, Inc.	bastiani@corp.adaptec.com
Mr. Bill Galloway	P	BREA Technologies, Inc.	billg@breatech.com
Mr. Robert C. Elliott	P	Compaq Computer Corp.	Rob_Elliott@compuserve.com

Dr. William Ham	A	Compaq Computer Corp.	bill.ham@digital.com
Mr. Ralph O. Weber	A	ENDL Texas	roweber@acm.org
Mr. Eugene Lew	P	Fujitsu	elew@fcpa.fujitsu.com
Mr. George O. Penokie	P	IBM Corp.	gop@us.ibm.com
Mr. John Lohmeyer	P	LSI Logic Corp.	lohmeier@t10.org
Mr. Frank Gasparik	V	LSI Logic Corp.	frank.gasparik@lsil.com
Mr. Alan Littlewood	V	LSI Logic Corp.	alanl@lsil.com
Mr. William Petty	V	LSI Logic Corp.	william.petty@lsil.com
Mr. David Steele	V	LSI Logic Corp.	david.steele@lsil.com
Mr. Larry Barnes	V	LSI Logic Corp.	larry.barnes@lsil.com
Mr. Brian Day	V	LSI Logic Corp.	brian.day@lsil.com
Mr. Jeff Gauvin	V	LSI Logic Corp.	jeff.gauvin@lsil.com
Mr. Makesh Kothandaraman	V	Lucent Technologies	makesh@lucent.com
Mr. Mark Strauss	V	Lucent Technologies	msstrauss@lucent.com
Mr. Richard Moore	A#	QLogic Corp.	r_moore@qlc.com
Mr. Ting Li Chan	V	QLogic Corp.	t_chan@qlc.com
Mr. Richard L. Ranianiec	V	QLogic Corp.	r_ranianiec@qlc.com
Mr. Mark Evans	P	Quantum Corp.	mark.evans@quantum.com
Mr. Bruce Leshay	V	Quantum Corp.	bleshay@tdh.qntm.com
Mr. Richard Uber	V	Quantum Corp.	duber@tdh.qntm.com
Mr. Gene Milligan	P	Seagate Technology	Gene_Milligan@notes. seagate.com
Mr. Daniel (Dan) F. Smith	O	Seagate Technology	daniel_f_smith@notes. seagate.com
Mr. Mayank R. Patel	V	Seagate Technology	mayank_r_patel@notes. seagate.com
Mr. John Masiewicz	V	Seagate Technology	john_masiewicz@notes. seagate.com
Mr. Paul D. Aloisi	P	Texas Instruments	Paul_Aloisi@ti.com
Mr. Mike Kosco	V	Texas Instruments	mike@mbuilders.com
Mr. John T. Wilson	V	Texas Instruments	jwilson@dal.asp.ti.com

31 People Present

Status Key: P - Principal
 A,A# - Alternate
 O - Observer
 L - Liaison
 V - Visitor

4. SPI-4 Physical Topics

4.1 Free Running Clock

4.1.1 SPI-4 clocking proposal (99-262) [Petty]

Bill Petty asked that discussion of this item be deferred to the next meeting.

4.1.2 ISI Compensation Selection [Penokie]

George Penokie noted that the apparent result of the proposals accepted during the meeting is that driver precompensation will be mandatory and receiver adjustable active filters will not be defined in SPI-4. It was noted that the necessary training patterns for receiver adjustable active filters will be transmitted.

4.2 Training Patterns

4.2.1 Ultra320 SCSI Calibration Protocol (00-133) [Leshay]

Bruce Leshay presented 00-133r3. He noted that the pauses requested at the last meeting have been added in this revision of the proposal. Concerns were raised about the omission of some of the training patterns requested during the last meeting. Gene Milligan indicated that the training patterns were picked up in his 99-295 proposal.

A new issue was stopping the free running clock. The DATA OUT phase presented more challenges because the initiator is driving the free running clock, but it's the target that decides to exit the phase, which must be preceded by stopping the clock.

4.2.2 Proposal for training pattern to be included in SPI-4 (00-132) [Evans]

Mark Evans stated that 00-132 covers the specific words for the proposal presented in overview form in 00-133.

4.2.3 Proposed Training for Skew Compensation (00-174) [Bastiani]

Vince Bastiani stated that this topic will need to be reviewed in the context of 99-295 (covered in 4.3.1).

4.3 Timings

4.3.1 Proposal for Fast-160 to be included in SPI-4 (99-295) [Milligan]

Gene Milligan reviewed the latest revision of his proposal. George Penokie moved that the 8.333 ns transfer period be removed from the Transfer Period Factor table (with the effect that code 8 takes the meaning currently shown for code 7 and code 7 becomes reserved). Bill Galloway seconded the motion. The motion passed on a vote of 7:2:1.

Gene Milligan moved that 99-295r5 (r4 as revised) be recommended for incorporation in SPI-4. Larry Lamers seconded the motion. The motion passed 8-0-2.

Mark Evans moved that the free running clock and the training patterns shall be used only at Fast-160 and beyond. George Penokie seconded the motion. Gene Milligan spoke against the motion noting that the free running clock might in some unusual cases be useful at slower speeds. George Penokie noted that the Fast-160 features might be detrimental at slower speeds. Bruce Leshay noted that the equalization circuitry would be more complicated if equalization were supported at slower speeds. The motion passed on a vote of 7:2:1.

4.3.2 Clock Frequency Restrictions for Fast-160 [Evans]

Mark Evans asked that this item be dropped from this and future agendas.

4.3.3 Fast-160 Driver and Receiver Masks (00-198) [Aloisi]

Paul Aloisi asked that this item be dropped from this and future agendas.

4.4 Test Configurations

4.4.1 Use of eye measurements (00-126) [Bastiani]

Vince Bastiani asked that discussion of this item be deferred to a subsequent meeting.

4.4.2 Ultra320 into fully populated 10-slot backplane (00-195) [Brown]

Mark Evans asked that this item be dropped from this and future agendas.

4.4.3 Requirements for Measuring Receive Signals in SPI-4 and beyond (00-149) [Ham]

There was no new information on this topic (see also agenda items 4.4.7 and 4.7.1).

4.4.4 Receiver Input Voltage Budget for Eye Patterns (00-158) [Bridgewater]

Vince Bastiani asked that discussion of this item be deferred to a subsequent meeting.

4.4.5 Details of test set-up used by Quantum for Ultra320 data (00-214) [Evans]

Mark Evans reviewed the goals of his document showing all the test configurations used by Quantum (00-215r0) and then presented the details of the configurations (00-214r0).

4.4.6 Quantum Ultra320 SCSI Test Configurations (00-215) [Evans]

This topic was covered under agenda item 4.4.5.

4.4.7 Specifying signals at receiver using receiver equalization (00-223) [Uber]

Richard Uber presented a proposal for how to specify signals when using equalization.

4.4.8 Validation of Quantum lab setup used for testing Ultra320 (00-224) [Uber]

Richard Uber presented 00-224, validation of Quantum lab setup for testing Ultra320.

4.4.9 Transmitter precompensation when using receiver equalization (00-225) [Uber]

Richard Uber presented data showing that equalizing signals that had been precompensated performs more poorly than equalization alone. He also showed that precompensation alone helps, but not as much as equalization alone.

4.4.10 Precompensation and test measurements (00-194) [Manildi]

John Masiewicz presented new laboratory data from Seagate.

4.5 Other SPI-4 Physical Topics

4.5.1 Precompensation and test measurements (00-194) [Manildi]

Owing to the topic contents, this item was moved to 4.4.10.

4.5.2 Comments on adaptive filtering for Ultra320 SCSI (00-196) [Brown]

Mark Evans asked that this item be dropped from this and future agendas.

4.5.3 Expander Topics (00-199) [Ham]

Bill Ham moved that technical content of 00-199r0 be recommended for incorporation in SPI-4 as a normative annex. Gene Milligan seconded the motion. Consideration of the motion was deferred until later in the meeting (after people had time to review the document). Later, George Penokie noted a few discrepancies in the document (e.g., references to HVD). Bill realized that he needed to make some revisions to the document and asked to withdraw his motion. He accepted an action item to revise 00-199.

4.5.4 The zero offset problem for receiver equalization (00-201) [Bridgewater]

Vince Bastiani asked that discussion of this item be deferred to a subsequent meeting.

4.5.5 Next Meeting Testing Data [Penokie]

George Penokie asked that this item be dropped from this and future agendas.

4.5.6 Should QAS be obsoleted in SPI-4? [Elliott]

Rob Elliott suggested that QAS be obsoleted in SPI-4. He noted that the performance gain of approximately 2 microseconds does not justify continued usage of QAS. Bruce Leshay noted that QAS fairness only really works if all devices on the bus support QAS. A straw poll was conducted with one vote per organization on whether QAS should be obsoleted in SPI-4 with 6 in favor, 2 against, and 2 abstaining.

Rob agreed to prepare a written proposal (00-228).

4.6 Protocol

4.6.1 Remove Data Groups from F-160 [Penokie]

George Penokie proposed that in SPI-4, the Fast-160 data transfer rate be limited to packetized protocol only. Some felt that this decision needs marketing input. George was asked to make the proposal known on the reflector and he agreed to do that. Technical issues were discussed related to padding 32-bit transfers in non-packetized. John Masiewicz stated a concern that restricting Fast-160 to packetized protocol could delay acceptance of Fast-160 products because of interoperability issues with packetized protocol.

George stated that he would bring this issue forward for consideration at the May meetings.

4.6.2 Flow Control & Read Streaming (00-142) [Lamers]

Larry Lamers presented 00-142r1, Flow Control & Read Streaming. Based on the group's input, Larry agreed to prepare a rev 2 of his proposal.

4.7 Receiver Issues

4.7.1 Receiver Specifications [Ham]

Bill Ham proposed a technique for specifying receiver filter (equalization) behavior. Concerns were raised about the increased difficulty of designing receivers to Bill's model. Bill asked if his concept should be incorporated in Gene's proposal (see 4.3.1) and Gene stated that Bill should draft a new proposal for additions to SPI-4.

4.7.2 Calculated Signal Losses (00-227) [Aloisi]

Paul Aloisi presented 00-227r0, Calculated Signal Losses. Questions were raised about the cable type that Paul used; several people claimed that the losses seemed excessive. The people present agreed to review Paul's data for the next meeting. It was noted that some related data is available in 99-326.

5. Expanders and Domain Validation Topics

5.1 SCSI out of band communications method (99-213) [Petty]

The group discussed whether this topic belongs in SPI-4. The alternate home for this concept could be the Domain Validation Technical Report. The group agreed to defer consideration of this topic to a subsequent meeting.

6. New Business

6.1 SPI-3 Public Review Comment #1 (00-219) [Penokie]

George Penokie described a public review comment submitted for SPI-3. The problem was one instance where an ABORT TASK message does not result in the target going to the Bus Free phase. George notified the group that SPI-3 revision 14 was prepared as a proposed response to the public review comment and was posted on the T10 ftp/web site. During the May meeting, SPI-3 revision 14 will be considered for forwarding to second public review.

7. Meeting Schedule

The next meeting of the Parallel SCSI Working Group will be Tuesday, May 16, 2000 commencing at 9:00 a.m. at the Sheraton Hotel (603-888-9970) in Nashua, NH hosted by Hitachi Cable Manchester.

The subsequent meetings of this group are Thursday, June 15, 2000 commencing at 9:00 a.m. and continuing Friday, June 16, 2000 in Lisle, IL and July 11, 2000 in Colorado Springs, CO.

Bill Ham noted that the SSM and SPIP ad hocs are requesting subsequent meetings as follows:

Meeting	Date	Location / Contact
SPIP SG	08/14-15/00 Mon-Tue	Colorado Springs / LSI Logic
SSM WG	08/15-16/00 Tue-Wed	Colorado Springs / LSI Logic
SPIP SG	10/11-12/00 Wed-Thu	Santa Clara / Seagate
SSM WG	10/12-13/00 Thu-Fri	Santa Clara / Seagate

Bill suggested that the Parallel SCSI WG consider meeting in conjunction with these meetings.

8. Adjournment

The meeting was adjourned at 2:58 p.m. on Thursday April 27, 2000.