Accredited Standards Committee*
National Committee for Information Technology Standards (NCITS)

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Reply to:	John Lohmeyer

To: T10 Membership
From: Ralph Weber & John Lohmeyer
Subject: Parallel SCSI Working Group Meeting -- September 12, 2000
Huntington Beach, CA

Agenda

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     - 4.3.19 Worst Case Signal Amplitude Calculations Spreadsheet (00-350) [Manildi]
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     - 4.4.4 PPR/MESSAGE REJECT implied agreement (00-337) [Elliott]

5. SPI-4 review [Penokie]
   5.1 SPI-4 Clarifications (00-322) [Moore]
6. Expanders and Domain Validation Topics
   6.1 Report on the SCSI Domain Validation Meeting (00-305) [Lohmeyer]
7. New Business
   7.1 Error Corrections in ISO SPI-3 (Milligan)
8. Meeting Schedule
9. Adjournment

Results of Meeting

1. Opening Remarks

John Lohmeyer, the T10 Chair, called the meeting to order at 9:00 a.m., Tuesday, September 12, 2000. He thanked Skip Jones of QLogic 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 the following changes.

4.2.2 ATN timing for Paced Transfers (00-343) [Galloway]
4.3.14 Vn for OR-Tied Signals (00-320) [Moore]

The following items were added/revised during the course of the meeting:

4.2.3 Setup and Hold Diagrams (00-353) [Milligan]
4.3.15 Ultra320 First Pulse Noise Margin (00-346) [Evans]
4.3.16 SPI-4 Spec Proposal for Ultra320 (00-347) [Evans]
4.3.17 First Pulse and Attenuation Data (00-348) [Manildi]
4.3.18 Attenuation in Actual Subsystems (00-349) [Manildi]
4.3.19 Signal Calculations (00-350) [Manildi]
4.3.20 Comparison of Precomp and AAF (00-351) [Manildi]
7.1 Error Corrections in ISO SPI-3 (Milligan)

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. Ron Roberts	A	Adaptec, Inc.	Ron_Roberts@adaptec.com
Mr. Vince Bastiani	V	Bass Technology Consulting	bass.tech@gte.net
Mr. Bill Galloway	P	BREA Technologies, Inc.	billg@breatech.com
Mr. Edward Haske	P	CMD Technology	haske@cmd.com
Mr. Robert C. Elliott	P	Compaq Computer Corp.	Rob_Elliott@compuserve.

			com
Dr. William Ham	A	Compaq Computer Corp.	bill_ham@ix.netcom.com
Mr. Ralph O. Weber	P	ENDL Texas	roweber@acm.org
Mr. Douglas Wagner	P	FCI	dwagner@fciconnect.com
Mr. Eugene Lew	P	Fujitsu	elew@fcpa.fujitsu.com
Mr. Dennis Moore	P	KnowledgeTek, Inc.	dmoore@ix.netcom.com
Mr. John Lohmeyer	P	LSI Logic Corp.	lohmeyer@t10.org
Mr. Larry Barnes	V	LSI Logic Corp.	larry.barnes@lsil.com
Mr. Brian Day	V	LSI Logic Corp.	brian.day@lsil.com
Mr. Jeffrey J. Gauvin	V	LSI Logic Corp.	jeff.gauvin@lsil.com
Mr. William Petty	V	LSI Logic Corp.	william.petty@lsil.com
Mr. Chuck Grant	P	Madison Cable Corp.	cgrant@madisoncable.com
Mr. Glen Griessler	A	Molex Inc.	ggriessler@molex.com
Mr. Gregg Neely	O	NSTOR	greggn@nstor.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. Romaniec	V	QLogic Corp.	r_romaniec@qlc.com
Mr. Tim Hsia	V	QLogic Corp.	t_hsia@qlc.com
Mr. Henry Kuo	V	QLogic Corp.	h_kuo@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. Gerald Houlder	A	Seagate Technology	gerry_houlder@notes.seagate.com
Mr. A. Bruce Manildi	V	Seagate Technology	bruce_manildi@notes.seagate.com
Mr. Erich Oetting	P	Storage Technology Corp.	erich_oetting@stortek.com
Mr. Vit Novak	A	Sun Microsystems, Inc.	vit.novak@sun.com
Mr. Paul D. Aloisi	P	Texas Instruments	Paul_Aloisi@ti.com
Mr. Donald R. Getty	A#	Texas Instruments	donald_getty@ti.com
Mr. Mike Kosco	V	Texas Instruments	mike@mvbuilders.com
Ms. Tanya Huynh	O	Thomas & Betts Corp.	tanya_Huynh@tycoelectronics.com
Mr. Davin Stockwell	R	Thomas & Betts Corp.	dstockwell@thombetts.com
Mr. George O. Penokie	P	Tivoli Systems	gop@us.ibm.com
Mr. Ron Mathews	O	UNISYS Corporation	ronald.mathews@unisys.com

39 People Present

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

4. SPI-4 Physical Topics

4.1 Training Patterns

4.1.1 Getting Training Started in SPI-4 (00-324) [Penokie]

George Penokie presented a proposal to clarify how training gets started. The group requested several changes. George Penokie moved that 00-324r3 (r2 as modified) be recommended for inclusion in SPI-4. Bill Galloway seconded the motion. In the absence of any objections, the motion passed unanimously.

4.2 Timings

4.2.1 Proposal for revision of the timing tables and definitions in SPI-4 (00-323) [Milligan]

Gene Milligan reviewed the recent changes to the timing tables proposal (00-323r3). Minor corrections were requested. Gene Milligan moved that 00-323r4 (r3 as modified) be recommended for inclusion in SPI-4. Bill Galloway seconded the motion. In the absence of any objections, the motion passed unanimously.

4.2.2 ATN timing for Paced Transfers (00-343) [Galloway]

Bill Galloway presented the timing requirements for ATN signaling in SPI-4 (00-343r1), explaining how the numbers were derived. He also presented wording changes to clarify timing on the P_CRCA signal. Minor corrections were requested and Bill agreed to revise the proposal. Bill Galloway moved that 00-343r2 (r1 as modified) be recommended for inclusion in SPI-4. Gene Milligan seconded the motion. In the absence of any objections, the motion passed unanimously.

4.2.3 Setup and Hold Diagrams (00-353) [Milligan]

Gene Milligan presented a proposal for changing the setup and hold diagrams in SPI-4. The group asked that the figures for Fast-80 speeds be removed from the proposal. Gene asked for and received the unanimous consent of the group for recommending inclusion of 00-353r1 (r0 as modified) in SPI-4.

4.3 Other SPI-4 Physical Topics

4.3.1 LVD Driver Balance for Ultra320 SCSI (00-319) [Uber]

Richard Uber asked that this item be removed from future agendas.

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

Richard Uber asked that this item be removed from future agendas.

4.3.3 Cable Attenuation (00-235r0) [Uber]

Richard Uber asked that this item be removed from future agendas.

4.3.4 Cable measurements and Calculated Signal Loss (00-276) [Manildi]

This item was carried over from the July and August meetings. Bruce had nothing new to add, so the topic will be removed from future agendas.

4.3.5 Calculated Signal Losses (00-227 and 00-246) [Aloisi]

Paul Aloisi reviewed the signal loss spreadsheet (00-227r9) and followed that with assumptions and requirements proposed for SPI-4 (00-246r5). Corrections were requested and Paul agreed to make them. Paul Aloisi moved that 00-246r6 (r5 as modified) with the receiver mask from 00-347r0 be recommended for inclusion in SPI-4. George Penokie seconded the motion. Bill Ham stated that Compaq would be voting against the proposal because of the three operating environments that he views as inappropriate for a standard. The motion passed 5:4:5.

4.3.6 SPI-4 - Assumptions for the Receiver and Driver levels (00-239) [Aloisi]

This subject was covered under 4.3.5.

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

This topic was covered under 4.3.8.

4.3.8 Receiver Response Requirements (00-332) [Ham]

Bill Ham presented a proposal for specifying the behavior of a filtering receiver. Bill sought specific numbers to fill in TBD numbers in the proposal and some data were offered. Several corrections and changes were requested and Bill agreed to revise the proposal. Bill asked if the proposal could be approved today, but requests were made to give time for review the proposal with the engineers ‘at home’.

Bill agreed to provide a revised document for review in a few weeks.

4.3.9 ATN timing for Paced Transfers () [Galloway]

Because this topic concerns timing issues, it was moved to 4.2.2.

4.3.10 Paced information unit timing description (00-336) [Penokie]

George Penokie reviewed text destined for SPI-4 revision 1 that the group asked to see separately (00-336r0). The group requested several changes and corrections. George agreed to prepare a revision 1 for consideration.

4.3.11 Periodic structures on SCSI buses (00-352) [Barnes]

Larry Barnes presented an update on the signal transmission model approach to SCSI bus properties first presented at the August working group meeting in Denver.

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

Larry Lamers requested that this item be removed from future agendas.

4.3.13 Losses on LVD Buses (00-331) [Uber]

Richard Uber asked that this item be removed from future agendas.

4.3.14 Vn for OR-Tied Signals (00-320) [Moore]

Richard Moore agreed to withdraw this proposal since the change was included in Paul Aloisi’s 00-246r6 proposal.

Chair’s note: Since Paul’s proposal was not approved by T10, this topic will be kept on the agenda for the October 31st Parallel SCSI Working Group meeting.

4.3.15 Ultra320 First Pulse Noise Margin (00-346) [Uber]

Richard Uber presented 00-346r0, Ultra320 First Pulse Noise Margin. Richard concluded that AAF works with worst-case bus signals and that pre-compensation would not work with worst-case bus signals unless the bus parameters are relaxed.

4.3.16 SPI-4 Spec Proposal for Ultra320 (00-347) [Uber]

Richard Uber presented 00-347r0, SPI-4 Spec Proposal for Ultra320, which proposes specific changes he would like to make in the SPI-4 draft standard.

4.3.17 First Pulse and Attenuation Data (00-348) [Manildi]

Bruce Manildi presented an overview of measurement data; describing the components used, the test equipment, and analysis techniques. He also presented specific data traces that he selected from the large collection of data and data traces for cases requested by various individuals in the group.

4.3.18 Attenuation in Actual Subsystems (00-349) [Manildi]

Bruce Manildi presented 00-349r0, Attenuation in Actual Subsystems. Bruce concluded that backplanes with short ribbon cables do not need pre-compensation nor AAF. Subsystems with long cables need some sort of frequency compensation. No subsystem tested had a high-frequency loss of greater than 30% including noise, crosstalk, and process variations.

Bruce invited people to people to use the Seagate lab to make their own measurements and/or send him materials to measure.

4.3.19 Worst Case Signal Amplitude Calculations Spreadsheet (00-350) [Manildi]

Bruce Manildi reviewed his signal loss calculations and signal level proposals for SPI-4. He noted the group had already approved an equivalent proposal under agenda item 4.3.5. He concluded that pre-compensation works at worst case extremes that will actually occur and that it has extra margin even under these conditions.

4.3.20 Comparison of Precomp and AAF (00-351) [Manildi]

Bruce Manildi elected to not present this document at the meeting since 00-246r6 had already been recommended to T10.

4.4 Protocol

4.4.1 SPI-4 IU Handling Clean-up (00-335) [Penokie]

George Penokie presented a proposal to cleanup wording in the description of information unit handling. He noted that the genesis of the proposal was a series of Reflector discussions about loopholes in the existing wording. The group requested several changes and George agreed to revise the proposal. George Penokie moved that 00-335r1 (r0 as modified) be recommended for inclusion in SPI-4. Bill Galloway seconded the motion. The motion passed on a vote of 5:1:2.

4.4.2 QAS without IU in SPI-4 (00-252) [Elliott]

Rob Elliott presented a proposal to allow QAS without information units. He noted that only information unit devices could initiate a QAS, but that any device can participate in a QAS arbitration. He asked if the proposal was something worth pursuing to the development of specific wording and the group recommended revising the proposal with specific wording changes.

4.4.3 Bidirectional data transfers in SPI-4 (00-314) [Elliott]

Rob Elliott presented a proposal for adding bidirectional data transfers in SPI-4. Rob's proposal contained specific SPI-4 changes to support bidirectional transfers and the group discussed these specifics.

Bill Galloway asked if there was anyone present who wanted to do bidirectional data transfers in data group (non-packetized) transfers. No one present supported defining bidirectional data group transfers.

Rob plans to prepare another revision based on the comments received from the working group.

4.4.4 PPR/MESSAGE REJECT implied agreement (00-337) [Elliott]

Rob Elliott presented a proposal that attempted to close a loophole in the case where a PPR message gets rejected. Bill Galloway noted that the proposal also has loophole. The group discussed how best to revise the proposal and Rob agreed to bring an improved proposal to the next meeting.

5. SPI-4 review [Penokie]

5.1 SPI-4 Clarifications (00-322) [Moore]

Richard Moore presented a proposal for several wording enhancements in SPI-4 (00-322r1). Larry Lamers moved that text content (minus the figure) of 00-322r1 be recommended for inclusion in SPI-4. Bruce Manildi seconded the motion. George Penokie asked that the proposal be revised to state that explicitly that the figure is not to be included in SPI-4. The motion was amended to state 00-322r2 (r1 as modified). The amended motion passed on a vote of 8:1:1.

6. Expanders and Domain Validation Topics

6.1 Report on the SCSI Domain Validation Meeting (00-305) [Lohmeyer]

John Lohmeyer reported on the activities of the Domain Validation working group (minutes in 00-305).

7. New Business

7.1 Error Corrections in ISO SPI-3 (Milligan)

Gene Milligan asked if the group wished correct any of the errors in the ISO version of SPI-3 based on knowledge developed so far in preparation of SPI-4. The group recommended against making any changes in SPI-3.

8. Meeting Schedule

The next meeting of the Parallel SCSI Working Group will be Tuesday October 31, 2000 commencing at 9:00 a.m. in Seaside, CA.

9. Adjournment

The meeting was adjourned at 6:45 p.m. on Tuesday, September 12, 2000.