

Accredited Standards Committee*

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Reply to: John Lohmeyer

To: T10 Membership
From: Ralph Weber / John Lohmeyer
Subject: SPI-3 Working Group Meeting -- March 9, 1999
Harrisburg, PA

Agenda

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6. Meeting Schedule
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Results of Meeting

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1. Opening Remarks

George Penokie, the T10 Vice-chair, called the meeting to order at 9:00 a.m., Tuesday March 9, 1999. He thanked John Hill and Beth Shutt of AMP 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 additions and changes:

- 4.23 Slower DT Timing Values [Milligan]
- 4.24 DT CRC Description [Leshay]

No agenda items were added during the course of the meeting.

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.	ljlammers@ieee.org
Mr. Vincent Bastiani	A#	Adaptec, Inc.	bastiani@corp.adaptec.com
Mr. Scott Lindstrom	P	AMP, Inc.	slindstr@amp.com
Mr. Charles Brill	A	AMP, Inc.	cebrill@amp.com
Mr. Elwood Parsons	V	AMP, Inc.	etparson@amp.com
Mr. Bill Mable	P	Amphenol Interconnect	bmable@spectra.net
Mr. Bill Galloway	P	BREA Technologies, Inc.	billg@breatech.com
Mr. Bob Gannon	O	C&M Corp.	rgannon@cm-corp.com
Mr. Francesco Liburdi	V	Circuit Assembly Corp.	fliburdi@circuitassembly.com
Mr. Edward Haske	P	CMD Technology	haske@cmd.com
Mr. Robert C. Elliott	P	Compaq Computer Corp.	Robert.Elliott@compaq.com
Dr. William Ham	A	Compaq Computer Corp.	bill.ham@digital.com
Mr. Neil Wanamaker	O	Crossroads Systems, Inc.	ntw@crossroads.com
Mr. Stephen K. Wilson	O	Crossroads Systems, Inc.	steve@crossroads.com
Mr. Bill Anderson	O	DDK Electronics	bill_anderson@ddkconnectors.com
Mr. Ben-Koon Lin	P	Fujitsu (FCPA)	blin@fcpa.fujitsu.com
Mr. Nathan Hastad	O	General Dynamics	nathan.j.hastad@gd-is.com
Mr. Marcos Barrionuevo	P	Harting, Inc. of N. America	Marcos.Barrionuevo@harting.com
Ms. Jacqueline Sylvia	A	Hitachi Cable Manchester	jsylvia@hcm.hitachi.com
Mr. George Penokie	P	IBM Corp.	gop@us.ibm.com
Mr. Hayden Smith	P	Lasercard Systems Corp.	hsmith@lasercard.com
Mr. John Lohmeyer	P	LSI Logic Corp.	lohmeier@ix.netcom.com
Mr. Ralph O. Weber	A	LSI Logic Corp.	roweber@acm.org
Mr. Frank Gasparik	V	LSI Logic Corp.	frank.gasparik@lsil.com
Mr. Alan Littlewood	V	LSI Logic Corp.	alanl@lsil.com
Mr. Steve Stefek	V	LSI Logic Corp.	steve.stefek@lsil.com

Mr. Makesh Kothandaraman	V	Lucent Technologies	makesh@lucent.com
Mr. Steve Siegel	V	Lucent Technologies	stefansiegel@lucent.com
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Mr. Robert Bellino	V	Madison Cable Corp.	rbellino@madisoncable.com
Mr. Charley Riegger	A	Maxtor Corp.	charles_riegger@maxtor.com
Mr. Jay Neer	A	Molex Inc.	jneer@molex.com
Mr. Martin Ogbuokiri	O	Molex Inc.	mogbuokiri@molex.com
Mr. Brian McKean	P	Mylex Corp.	brianm@mylexboulder.com
Mr. Edward A. Gardner	P	Ophidian Designs	eag@ophidian.com
Mr. Dean Wallace	A	QLogic Corp.	d_wallace@qlc.com
Mr. Richard Moore	V	QLogic Corp.	r_moore@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. Mayank R. Patel	V	Seagate Technology	mayank_r_patel@notes.seagate.com
Mr. Robert Morris	P	Silicon Systems, Inc.	bob.morris@ti.com
Mr. Erich Oetting	P	Storage Technology Corp.	erich_oetting@stortek.com
Mr. Robert N. Snively	P	Sun Microsystems Computer Co	bob.snively@sun.com
Mr. Vit Novak	A	Sun Microsystems, Inc.	vit.novak@sun.com
Mr. Kenneth J. Hallam	P	UNISYS Corporation	ken.hallam@unisys.com
Mr. Paul D. Aloisi	P	Unitrode Corporation	aloisi@unitrode.com
Mr. Donald R. Getty	A	Unitrode Corporation	gettd@unitrode.com
Mr. Richard S. DeMars	V	Unitrode Corporation	demars@unitrode.com
Mr. Jeffrey L. Williams	P	Western Digital Corporation	Jeffrey.L.Williams@wdc.com

52 People Present

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

4. SPI-3 Topics

4.1 Report on March 2nd Cable Testing Meeting

Bill Ham made an oral report on the activities of the cable performance specification meeting and provided an electronic report in 99-156r0.

Concerns were expressed about the length of cables (or length of backplane etch) being tested. Requests were made for simulations of cables at various lengths for the proposed high frequency transfers. Dean Wallace agreed to lead this effort and gather some information by the next working group meeting.

It was noted that the group would not delay publication of SPI-3 for this annex. The team working on the annex noted that they might prefer to provide a subset of the information for an annex in SPI-3 and more information for SPI-4.

4.2 Staged Contact Resistance (98-240r0) [Herrmann]

Chuck Brill asked that this topic be deferred to the May working group meeting.

4.3 Load Compensation (98-238r1) [Novak]

Vit presented laboratory and simulation data concerning his load compensation methods. The group discussed Vit's presentation. Concerns were raised about the simulation information. It was noted that the results of this work mostly likely would not be available in time for inclusion in SPI-3.

4.4 QA and Glitch Filters (98-239r0) [Leshay]

Bruce Leshay reported that he had no new proposal on this topic. He noted that some members disagree with the assertion that there is a problem. The possibility that other proposals under discussion at this meeting (see item 4.14) might address this problem was discussed, with no conclusion reached. Bruce indicated that approval of certain proposals might cause him to bring additional corrective proposals to the committee.

4.5 Timing Specification on ATN during synchronous transfers (99-112r1/99-120r0) [Galloway/Milligan]

Bill Galloway presented a proposal to change the SPI-3 Transmit Setup Time (ST and DT) and SPI-3 Receive Setup Time (ST and DT). The group discussed the proposed times and replaced a question mark with 45ns.

Timing for the handling of the ATN signal was discussed. Concerns were raised about the proposed wording. Some present wanted to return to the 'two deskew delays' wording, but others worried that a change in the definition of a deskew delay could make the wording invalid at some future day.

In the absence of any objections, the group unanimously recommended the proposal as modified (99-112r2) be approved by T10 for inclusion in SPI-3.

4.6 DIFFSENS Timing on bus mode changes (99-113r1) [Galloway]

Bill Galloway presented a revision of his proposal defining the timing of DIFFSENS signal handling. Questions were raised about the handling of high-voltage differential, references to terminators, and few other topics. Bill agreed to revise the proposal.

In the absence of any objections, the group unanimously recommended the proposal as modified (99-113r2) be approved by T10 for inclusion in SPI-3.

4.7 Synchronous Transfer Timeout Function (99-102r4) [Lamers]

Larry Lamers reviewed the proposal, noting that it was discussed in depth in January. Larry agreed to prepare revision 5 to replace the 'Ralph' field with 'Protocol Identifier'. In the absence of any objections, the working group unanimously recommended that 99-102r5 be approved by T10 for inclusion in SPC-2.

4.8 Proposed Domain Validation Annex (98-235r2) [Lohmeyer]

John Lohmeyer reported that the group discussed and revised the domain validation proposal during an informal meeting the previous day. He agreed to bring a revised proposal to the next working group meeting.

4.9 Message Information Unit Definition (99-104r0) [Penokie]

George Penokie presented a proposal that allows a return to the message phases during packetized operation (for the purpose of negotiating out of using information units). Corrections were recommended regarding the usage of 'unexpected bus free' in the proposal wording. A failure condition resulting in an unknown state for the transfer parameters was discussed, resulting in changes to the proposal. George agreed to modify the proposal for approval at the plenary.

In the absence of any objections, the group unanimously recommended the proposal as modified (99-104r1) be approved by T10 for inclusion in SPI-3.

4.10 30 mV vs. 60 mV in figures 44 and 45 (99-127r1) [Gasparik/Aloisi]

Paul presented a proposal for changes to ST and DT timing requirements. Several changes were agreed in 99-127r0 and Paul promised a revision.

Bill Ham led a discussion of the wording that defines glitch filters (although 'glitch filters' was not a term agreeable to the whole group). This was followed by discussions of other signal characterization issues.

As discussion progressed, Paul produced several additional revisions. On a vote of 14:1, the working group recommended that the proposal as modified (99-127r4) be approved by T10 for inclusion in SPI-3.

4.11 "May not" clarifications in SPI-3 (98-246r1) [Elliott]

Rob Elliott identified a few occurrences of 'may not' in SPI-3 and requested wording changes. The group discussed whether the replacement wording should be 'shall not' or 'should not', and agreed with Rob's solution. Minor changes were requested in the proposal text. In the absence of any objections, the group unanimously recommended the 98-246r1 be approved by T10 for inclusion in SPI-3.

4.12 Clarification of interaction of SDTR/WDTR message with PPR message (99-108r2) [Lohmeyer]

John Lohmeyer proposed that the PPR message be mandatory in SPI-3. Wording changes were recommended and accepted. Details of the interactions were discussed. In the absence of any objections, the group unanimously recommended the proposal as modified (99-108r3) be approved by T10 for inclusion in SPI-3.

4.13 Packetized CRC Proposal Merger (99-118, -124) [McGrath/Leshay]

Bruce Leshay agreed to withdraw his proposal in favor of 99-139.

4.14 Protection for the Asynchronous Information phases (99-119r1) [McGrath/Evans/Elliott]

Mark Evans presented a brief overview of the proposal to add additional error detection to the non-data phases and Rob Elliott presented a justification for the proposal. George Penokie debated the proposition that proposal provides minimum additional protection on the CDB, one of the largest structures proposed for error protection. The history of similar proposals was reviewed. Attempts were made to justify the need for this particular protection method based on customer demands and the probability of undetected errors. But, others described the probabilities of an undetected error using only today's parity as being so low as to be not worth the effort. Several others described long hours of testing wherein the postulated problems were never observed.

Mark Evans presented the proposal in detail, which involved use of the high eight bits on a wide bus (wide buses are now required for DT transfers). A cyclic binary BCH error code with a Hamming distance of 4 was selected. A 2-bit sequence counter is employed to detect double clocks and missing clocks. Questions were asked about how the mechanism is negotiated and Mark responded that the PPR message would be used. Other details of the negotiation mechanism were discussed and some missing information was identified in the proposal.

George Penokie conducted a straw poll on the question, "Should the group give further consideration to the proposal?" The vote was 5:7:5. It was noted that data supporting the need for this error detection mechanism would have a positive influence on future support for the proposal.

4.15 Setup and hold time measurements for Ultra 160/m (99-131) [Abou-Jeyah/Bastiani]

The group agreed to defer action on this topic to the next meeting.

4.16 Removing zero length data transfers with CRC (99-132) [Galloway]

Bill Galloway described a condition where DT transfers permit a data group of 0 length with only a CRC field. He then presented a proposal to prohibit this situation, requiring some nonzero amount of data transfer whenever a data phase is entered. Jeff Williams noted that he previously opposed the change, but now agrees with it. In the absence of any objections, the working group unanimously recommended that 99-132r0 be approved by T10 for inclusion in SPI-3.

4.17 Timing for SCSI RST line (99-133) [Galloway]

Bill Galloway described a problem where devices have been observed resetting due to crosstalk on the reset line and proposed changes to the standard that effectively requires a 200ns glitch filter on the reset line. Bruce Leshay noted that 800ns would be the largest time allowed by other specified behaviors. In the absence of any objections, the working group unanimously recommended that 99-133r0 be approved by T10 for inclusion in SPI-3.

4.18 PPR Protocol option negotiation (99-134) [Galloway]

Bill Galloway presented a concern the currently specified protocol negotiation mechanism is all or nothing. Either the requested transfer mode is accepted or the protocol falls back to asynchronous, narrow transfer mode. He proposed bit encoding the transfer mode as a solution and noted that responses could be the requested bit encoding with unsupported bits cleared, which comes closer to the negotiation scheme used in the Synchronous Data Transfer Request message.

George Penokie pointed out that the key change in the proposal is not the bit encoding of the transfer mode, the key change is allowing the PPR recipient to change the transfer mode to something other than asynchronous in the event of a mismatch between the request the capabilities. The group discussed whether the proposal correctly represents negotiation to least common denominator mechanism familiar to SCSI developers.

It was noted that the proposal fails to clearly state that bits can only be turned off in a response, not turned on.

Bill agreed to revise the proposal based on the group's comments. In the absence of any objections, the group unanimously recommended that the revised proposal (99-134r1) be approved by T10 for inclusion in SPI-3.

4.19 Patent Letter for SPI-3 from Adaptec (99-138) [Lamers]

John Lohmeyer reported the receipt of a patent statement letter from Adaptec. It does not identify specific patent(s). Gene Milligan noted that the letter needs to be sent to NCITS with the public review draft of SPI-3.

4.20 Packet Protocol Extensions (99-139, 99-151) [Milligan/Penokie/Lamers]

Larry Lamers reviewed the motivation for proposed changes to the packetized protocol that would enhance flow control. He discussed the interests of those proposing the changes, specifically desires to stream multiple data packets to get appropriate CRC coverage. Then he presented a proposal that responds to these concerns by adding a CRC Interval value to the packetized protocol definition.

Odd byte count transfers generated discussions of several topics including changing the meaning of the data length field. Concerns also were raised about changing the length of a L_Q information unit. It was agreed to change all counts to byte counts, and to have the data length reflect the actual byte count not including the pad bytes.

The discussion turned to the streaming part of the proposal. Strong sentiment was expressed against read streaming. Write streaming was generally agreed to save bus overhead time. In response to a request from George Penokie, the group voted 6:3 in a straw poll to recommend removal of read streaming from the proposal. The proposal authors took note of the straw poll.

Larry agreed to bring a revised proposal to the next working group meeting.

4.21 A Common CRC Method for Packetized and Legacy Devices (99-141) [Lamers]

Larry asked that discussion of this topic be deferred to the next meeting.

4.22 Review of SPI-3 working draft [Penokie]

Part of the draft was reviewed to confirm changes and to resolve Editor's Notes. The next working group is targeted to put a priority on the draft review.

4.23 Slower DT Timing Values (99-155r0) [Milligan]

Following up on Paul Aloisi's presentation (see 4.10), Gene Milligan presented issues concerning the timing diagram, with particular focus on the parts of the transition time that are not shown in the diagram. Gene closed by noting that the presentation was informational and not directed toward making changes in SPI-3.

4.24 DT CRC Description (99-157r0) [Leshay]

Bruce Leshay proposed changes to the description of the P_CRCA and the relationship of the signal to REQ. Bruce stated a belief that the changes were editorial in nature, but sought the group's opinion. Gene Milligan indicated his belief that the change is a significant technical change, but also that he agreed with making the change. Bruce accepted corrections to the proposal. In the absence of any objections, the group unanimously recommended that the revised proposal (99-157r1) be approved by T10 for inclusion in SPI-3.

5. SPI-4 Topics

5.1 Project Proposal for SPI-4 (Ultra320 SCSI) (99-140) [Lamers]

Larry presented a draft project proposal for SPI-4. The list of items that might be included in SPI-4 was discussed and Larry agreed to accept comments on the list for a revision of the proposal to be prepared for consideration at the May meetings. Larry agreed to incorporate the return on investment statement from at T13 project proposal. Larry agreed to bring a revised draft to the May meeting.

6. Meeting Schedule

The next meeting of the SPI-3 Working Group will be Wednesday, April 7, 1999 and Thursday, April 8, 1999 from 9:00 a.m. to 6:00 p.m. in Monterey, CA (see the meeting notice in 99-161).

The following meeting of the SPI-3 Working Group will be Monday, May 3, 1999 commencing at 1 p.m. recessing on Monday evening and continuing until 6 p.m. on Tuesday, May 4, 1999 at the Holiday Inn "The Center of NH" (603-625-1000) in Manchester, NH hosted by Hitachi Cable Manchester.

7. Adjournment

The meeting was adjourned at 10:35 a.m. on Wednesday March 10, 1999.