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

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Date:	November 10, 1998
Reply to:	John Lohmeyer

To: T10 Membership
From: Ralph Weber / John Lohmeyer
Subject: SPI-3 Working Group Meeting -- November 3, 1998
            Palm Springs, CA

Agenda

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Results of Meeting

1. Opening Remarks

John Lohmeyer, the T10 Chair, called the meeting to order at 9:00 a.m., Tuesday November 3, 1998. He thanked Larry Lamers of Adaptec 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:

    4.13   Cable Testing Requirements (98-219r1) [Daggett]
    4.14   QAS and Glitch Filters (98-239r0) [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 member-ship. 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:

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         Name          S      Organization        Electronic Mail Address
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Mr. Lawrence J. Lamers P  Adaptec, Inc.           ljlamers@ieee.org
Mr. Vincent Bastiani   A# Adaptec, Inc.           bastiani@corp.adaptec.com
Mr. Robert Frey        O  Advansys                bobf@advansys.com
Mr. Scott Lindstrom    P  AMP, Inc.               slindstr@amp.com
Mr. Charles Brill      A  AMP, Inc.               cebrill@amp.com
Mr. Hank Herrmann      O  AMP, Inc.               Hank.Herrmann@amp.com
Mr. Michael Wingard    A  Amphenol Interconnect   mikwingard@aol.com
Mr. Douglas Wagner     P  Berg Electronics        wagnerdl@bergelect.com
Mr. Bill Galloway      V  BREA Technologies       billg@breatech.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. Charles Tashbook   P  Dallas Semiconductor    charles.tashbook@dalsemi.
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Mr. Tom Jackson        P  Exabyte Corp.           thomasj@exabyte.com
Mr. Ben-Koon Lin       P  Fujitsu (FCPA)          blin@fcpa.fujitsu.com
Mr. Zane Daggett       P  Hitachi Cable Manchester, zdaggett@hcm.hitachi.com
                          Inc
Mr. George Penokie     P  IBM Corp.               gop@us.ibm.com
Mr. Dennis Moore       P  KnowledgeTek, Inc.      dmoore@ix.netcom.com
Mr. Louis Grantham     P  Linfinity Micro         lgrantham@linfinity.com
Mr. John Lohmeyer      P  LSI Logic Corp.         lohmeyer@ix.netcom.com
Mr. Alan Littlewood    A  LSI Logic Corp.         alanl@lsil.com
Mr. Steve Stefek       A# LSI Logic Corp.         steve.stefek@lsil.com
Mr. Ralph O. Weber     A# LSI Logic Corp.         roweber@acm.org
Mr. Frank Gasparik     V  LSI Logic Corp.         frank.gasparik@lsil.com
Mr. Charley Riegger    O  Maxtor Corp.            charles_reigger@maxtor.
                                                  com
Mr. Martin Ogbuokiri   O  Molex Inc.              mogbuokiri@molex.com
Mr. Dean Wallace       A# QLogic Corp.            d_wallace@qlc.com
Mr. Chandru Sippy      V  QLogic Corp.            c_sippy@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.
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Mr. Daniel (Dan) F.    O  Seagate Technology      daniel_f_smith@notes.
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Smith                                            seagate.com
Mr. Mayank R. Patel    V  Seagate Technology     patel@cdg.stsv.seagate.
                                                 com
Mr. Bill Gintz         V  Seus, Inc.             wcgintz@ix.netcom.com
Mr. Dave Guss          P  Silicon Systems, Inc.  dave.guss@tus.ssi1.com
Mr. Paresh Sheth       V  Silicon Systems, Inc.  paresh.sheth@tus.ssi1.com
Mr. Vit Novak          A  Sun Microsystems, Inc. vit.novak@sun.com
Mr. Bill Youngman      P  The JPM Company        byoungman@jpmsj.com
Mr. Paul D. Aloisi     P  Unitrode Corporation   aloisi@unitrode.com
Mr. Donald R. Getty    A  Unitrode Corporation   gettd@unitrode.com


42 People Present

Status Key:  P   -  Principal
             A,A# -  Alternate
             O   -  Observer
             L   -  Liaison
             V   -  Visitor
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4. SPI-3 Topics

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

Hank Herrmann presented an overview of the dual-conductivity contact connector system developed by AMP (98-240r0) for the SCA-2 connector. He showed test data based on a prototype connector and offered to show a sample connector to interested members. It was noted that the dual-conductivity contacts must be on the device connector, not the backplane connector. Unfortunately, this would mean that the extra costs associated with the dual-conductivity contacts might be borne by all applications, not just those that need hot plugging.

The group discussed what changes, if any, might be required in various standards to allow usage of this connector contact system. Making the dual-conductivity contact a requirement for case four hot-plugging also was discussed, but not pursued.

Patent issues were discussed and John noted that the ANSI patent licensing requirements would apply only if the dual-conductivity contact were to become a requirement in a standard.

4.2 Load Compensation (98-238r0) [Novak]

Vit Novak presented new data on load compensation (98-238r0) and requested feedback from the group on the new information. He noted that the data is very fresh from the laboratory and not well summarized. He described this presentation as a continuation of the work presented in November 1997, March 1998, and July 1998 (97-281r0, minutes in 97-272r1, 98-125r1, and 98-200r0).

Bill Ham and Bill Gintz expressed interest in Vit's work. Bill Ham offered advice regarding further simulations and laboratory tests that might be performed. Vit took several notes regarding future work.

4.3 Bias Reduction Proposal (98-156) [Bridgewater]

In the absence of Wally Bridgewater, discussion of this topic was deferred to the next meeting.

4.4 InterSymbol Interference (98-199) [Penman]

In the absence of Duncan Penman, Bruce Leshay requested that this item be deferred to the next meeting.

4.5 Setup and Hold Time Measurements (98-211r0) [Penman]

In the absence of Duncan Penman, Bruce Leshay requested that this item be deferred to the next meeting.

4.6 'Small' change to single-ended termination current (98-220r1, -226r1) [Grantham, Aloisi]

Louis Grantham presented the case for changing the single-ended termination current in SPI-3 (98-220r1). He characterized the case for not making the proposed change as an issue of whether older devices with higher leakage currents continue to need support in SPI-3.

Paul Aloisi presented the case for keeping the single-ended termination current as specified in SPI-2 (98-226r1). He said the proposed change was insufficient; other requirements also would have to be changed. Paul proposed that the formula specified in SPI-2 be changed to an I-V curve in SPI-3 and noted where changes in the I-V curve would be required to support the needs described by Louis.

The I-V curve concept proved acceptable to Louis, however, details of Paul's proposed curve worried him. Louis and Paul agreed to develop a mutually agreeable I-V curve for presentation at the next SPI-3 working group.

4.7 Removing 32-bit support from SPI-3 (98-231r0) [Elliott]

Rob Elliott's proposal would remove all 32-bit support from SPI-3. George Penokie described a tentative effort to define a single 32-bit cable and connector option. George agreed that the Q connector could be made obsolete, but proposed that other aspects of 32-bit support remain in SPI-3 for the time being.

A straw poll was taken as follows. A) Do you favor keeping 32-bit support in SPI-3 based on use of a single cable and connector? Received 6 votes. B) Do you favor removing all discussion of 32-bit support in SPI-3? Received 16 votes.

4.8 Review of SPI-3 Rev 1 [Penokie]

Gene Milligan asked if there is a schedule for the development of SPI-3. John Lohmeyer reported that the project proposal for SPI-3 says that forwarding to NCITS will occur in May, 1999. Gene suggested that the group consider setting a cutoff date for new proposals.

George Penokie led a page-by-page review of SPI-3 revision 1. Gene Milligan, Bill Galloway, Bruce Leshay, Vince Bastiani, Dan Smith, and others provided comments.

4.9 Quick Arbitrate Timing Issues (reflector messages) [Milligan/Moore]

George Penokie reported that this issue does not exist because the timing value does not appear in SPI-3. Bill Galloway noted some additional issues and Bruce Leshay noted that such issues can be discussed as part of the SPI-3 review.

Gene Milligan noted that timing definitions now include QA maximum assertion and release times, but the defined times are not used in the protocol description. The discussion then proceeded to the SPI-3 review. (Also see agenda item 4.14.)

4.10 Timing Specification on ATN during synchronous transfers (reflector messages) [Galloway/Milligan]

Bill Galloway described a problem with the system deskew delay. In SCSI-2, the deskew delay got smaller at higher transfer rates. In SPI-3, the deskew delay is a constant for all transfer rates. The concern was that, at high transfer rates, ATN cannot be asserted within the requirements stated in SPI-3, which complicates how the initiator reports errors to the target. Some of the complexity occurs when the host wants to report a parity error immediately so that

the failed byte can be determined. Other complexity occurs in very short transfers. George Penokie encouraged the development of a written, definitive change proposal.

4.11 Packetized SCSI Issue (98-237r0) [Sippy]

Chandru Sippy presented a concern related to an automatic Save Data Pointers function in the definition of packetized protocol. Chandru wanted this function to not be automatic to facilitate error recovery procedures. The group pointed out that a Modify Data Pointers message could be used in this case. Chandru said that a Modify Data Pointer message could not move the data point before the saved data pointer value. The group disagreed.

John Lohmeyer felt that a clarification about this point should be made to avoid further confusion. George noted that he would make no changes to SPI-3 in this area unless a written proposal is brought to the committee.

4.12 Proposed Domain Validation Annex (98-235r0) [Lohmeyer]

John Lohmeyer presented a proposal that an informative annex be added to SPI-3 describing domain validation. He described a concern that omission of any discussion of domain validation in SPI-3 will cause many questions to the chair. Several improvements to the proposed annex were suggested and John collected the ideas.

George Penokie objected to the inclusion of a definition of 'domain validation' in SPI-3 based on concerns that the definition is not complete as proposed and cannot be complete long-term, because technological changes will obsolete a given definition on a regular basis. The group compared 'domain validation' to 'SMART'. But, Bill Galloway noted that 'domain validation' is different because entities developed by different companies will need to act cooperatively, whereas the 'SMART' capability can be fully implemented inside the bounds of a single device developed by one manufacturer.

John agreed to bring a revised proposal to the next meeting.

4.13 Cable Testing Requirements (98-219r1) [Daggett]

Zane Daggett reported on the cable testing work preparatory to creating a revised testing annex for SPI-3. The group discussed the tests proposed, suggesting additions and changes. Skew, cross talk, and connector effects were among the subjects discussed.

Zane requested authorization of an ad hoc meeting on 2 December to discuss cable testing to be held in Manchester, NH hosted by Hitachi Cable represented by Zane Daggett. Vince Bastiani, Dan Smith, Frank Gasparik and several others expressed interest in attending.

4.14 QAS and Glitch Filters (98-239r0) [Leshay]

Bruce Leshay presented concerns about how glitch filters might cause failure to detect critical byte sequences in quick arbitration (98-239r0). The group agreed that the problem appeared to be real, but found no immediate solutions.

5.   Meeting Schedule

In view of the late hour, John Lohmeyer noted that allocating only one half day in March for SPI-3 issues is not enough.

The next meeting of the SPI-3 Working Group with T10 will be Tuesday, March 9, 1999 from 9 a.m. to 6 p.m. at a location in Harrisburg, PA to be announced by the host, AMP. John reported that the details will be announced as soon as possible on the T10 reflector and a meeting announcement will be in the next T10 committee mailing.

John Lohmeyer noted that Larry Lamers had discussed with him the possibility of a SPI-3 Working Group on Tuesday-Wednesday, January 26-27, 1999 in Monterey, CA at the Embassy Suites hotel hosted by Adaptec, Inc. Since Larry was not present, the meeting proposal could not be confirmed.

Chair's Note: The above meeting was confirmed at the T10 plenary meeting on Thursday. See 98-243r0 for meeting details.

6.   Adjournment

The meeting was adjourned at 6:30 p.m. on Tuesday November 3, 1998.