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

To: Membership of T10

From: Ralph Weber, Secretary T10
            Larry Lamers, Vice-chair T10
            John Lohmeyer, Chair T10

Subject: Minutes of SPI-2 Working Group
            March 10, 1997 -- San Diego, CA

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Agenda

1. Opening Remarks

2. Approval of Agenda

3. Attendance and Membership

4. Universal backplane [Wallace/Barnes]

5. LVD case 4 hot plugging [Barnes]

6. Changing driver modes when hot plugging (96-270r1) [Penokie]

7. Single-ended termination (96-245r2) [Wallace]

8. Proposed clarification to Fig. 24 [Ham]

9. Issues with LVD [Harris]

10. Considerations for Ultra3 (97-146r0) [Harris/Bastiani/Gintz]

11. Integration Issues [Lamers]

12. Bus Set Delay Reduction (97-116) [Ham]

13. Hot-Plugging Data (97-144r0) [Ham]

14. REQ/ACK Glitch Filters [Ham]

15. Meeting Schedule

16. Adjournment

Results of Meeting

1. Opening Remarks

John Lohmeyer, the T10 Chair, called the meeting to order at 9:00 a.m., Monday March 10, 1997. He thanked Skip Jones of QLogic for hosting and arranging the meeting.

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

2. Approval of Agenda

The agenda was approved with the following additions:
13. Hot-Plugging Data [Ham]
14. REQ/ACK Glitch Filters [Ham]

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:

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        Name            S       Organization          Electronic Mail Address
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Mr. Norm Harris         P   Adaptec, Inc.             nharris@eng.adaptec.com
Mr. Tak Asami           A#  Adaptec, Inc.             asami@itc.adaptec.com
Mr. Lawrence J. Lamers  A   Adaptec, Inc.             ljlamers@aol.com
Mr. Wally Bridgewater   V   Adaptec, Inc.             wally@eng.adaptec.com
Mr. Tom Scheinder       V   Adaptec, Inc.
Mr. Bill Gintz          V   Adaptec, Inc.
Mr. Vincent Bastiani    V   Adaptec, Inc.             bastiani@corp.adaptec.com
Mr. Paul Wang           V   Adaptec, Inc.
Mr. Charles Brill       P   AMP, Inc.                 cebrill@amp.com
Ms. Bonnie Rose         V   Amphenol                  brose@cosmosgroup.com
Mr. Ron Roberts         A   Apple Computer            rkroberts@aol.com
Mr. Bob Gannon          0   C&M Corp.                 bobg848740@aol.com
Mr. Siegfried Schmalz   A   Dallas Semiconductor      schmalz@dalsemi.com
Mr. Greg McSorley       P   Data General / Clariion   greg_mcsorley@dgc.ceo.dg.
                                                      com
Dr. William Ham         A#  Digital Equipment Corp.   ham@subsys.enet.dec.com
Mr. George Penokie      P   IBM Corp.                 gop@rchvmp3.vnet.ibm.com
Mr. Louis Grantham      A   Linfinity Micro           lgdatcom@ix.netcom.com
Mr. Mark Granahan       V   Linfinity Micro           mgranahan@aol.com
Mr. Alan Littlewood     0   LSI Logic                 alanl@lsil.com
Mr. Wayne E. Werner     0   Lucent Technologies       wewerner@lucent.com
Mr. Daniel (Dan) F.     V   Mr. Brian N. Davis        daniel_smith@notes.seagate
Smith                                                 .com
Mr. Skip Jones          P   QLogic Corp.              sk_jones@qlc.com
Mr. Ting Li Chan        A   QLogic Corp.              t_chan@qlc.com
Mr. Gene Milligan       P   Seagate Technology        Gene_Milligan@notes.
                                                      seagate.com
Mr. Gerald Houlder      A   Seagate Technology        Gerry_Houlder@notes.
                                                      seagate.com
Mr. Dave Guss           P   Silicon Systems, Inc.     dave.guss@tus.ssi1.com
Mr. Vit Novak           A   Sun Microsystems, Inc.    vit.novak@sun.com
Mr. John Lohmeyer       P   Symbios Logic Inc.        john.lohmeyer@symbios.com
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Mr. Ralph O. Weber      A   Symbios Logic Inc.      roweber@acm.org
Mr. Brian McKean        A   SyQuest Technology, Inc. brian.mckean@syquest.com
Mr. Pete Tobias         P   Tandem Computers        tobias_pete@tandem.com
Mr. Jack Shiao          O   Tandem Computers        jack@loc3.tandem.com
Mr. Dave Wehrman        O   UNISYS                  dwehrman@unisys.com
Mr. Paul D. Aloisi      P   Unitrode Corporation    aloisi@unitrode.com
Mr. Gregory Kapraun     V   Western Digital Corp.   kapraun@wdroc.wdc.com
Mr. Doug Piper          P   Woven Electronics       doug.piper@internetmci.com
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36 People Present

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Status Key:  P    -   Principal
             A,A# -   Alternate
             O    -   Observer
             L    -   Liaison
             V    -   Visitor
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4.   Universal backplane [Wallace/Barnes]

Yes, it can be done. Larry Barnes was reported to have a tool that allows the calculation of the geometry for the backplane given the desired impedance. Larry plans to provide at least one set of numbers as an example; but he does not plan to provide the tool for developing the numbers.

5.   LVD case 4 hot plugging [Barnes]

John Lohmeyer said that last time he had been asked about whether Larry Barnes would be able to finish his simulation work on LVD case 4 hot plugging and whether Larry's input data were available. Unfortunately, Larry no longer has access to the simulation software, which is quite expensive. Also Larry declined to disclose the input data because it includes proprietary information about the Symbios Logic LVD pad. John suggested that this item be dropped from future agendas.

See also item 13.

6.   Changing driver modes when hot plugging (96-270r1) [Penokie]

George presented the proposal that requires reporting of transceiver mode changes to and from LVD. Gerry Houlder suggested that the ASC/ASCQ definitions be placed under the 29h ASC, as new ASCQs. George agreed with the suggestion and undertook to revise the proposal.

7.   Single-ended termination (96-245r2) [Wallace]

Louis Grantham presented revised proposal for the SPI-2 Termination I/V curve. He displayed the impedance characteristics for several different cables, in support of the proposal. After a brief discussion, the group agreed to continue discussing the proposal on the SCSI Reflector and to bring a proposal based on the results of the discussion to the next meeting.

8.   Proposed clarification to Fig. 24 [Ham]

Bill Ham said that his data suggest that figure 24 should not be changed. Bill requested that this issue be dropped from the agenda. John Lohmeyer expressed concern that an inconsistency exists if the figure is not changed. John and Bill discussed changes that should and should not be made to the figure. The group agreed to review the figure again at the next meeting, after everybody has a chance to review the current proposed figure with their engineers.

9.   Issues with LVD [Harris]

Norm Harris began his presentation with a review of the development of LVD SCSI. The conclusion of Norm's presentation was that there are no demonstrable problems with LVD SCSI at 40 mega-transfers per second. However, the same signaling technology cannot be run at faster transfer speeds, say 80 mega-transfers per second, without some changes to signaling technology, device count, or maximum cable length.

10.   Considerations for Ultra3 (97-146r0) [Harris/Bastiani/Gintz]

Vincent Bastiani described a test setup used evaluate the signal integrity of the current LVD SCSI definition. Bill Ham noted the "first pulse detection" issue described by Vincent is exactly the "inter-symbol interference" issue that he has described during past meetings. Bill Gintz gave some analysis of the causes of the problems observed earlier in the presentation in terms of harmonic signal analysis. Then, Vincent presented some proposals for resolving the issues raised. There was considerable debate over these proposals with no clear consensus. The group agreed to consider the proposals in more detail during a SPI-2 meeting scheduled for April 18th in San Jose, CA.

11.   Integration Issues [Lamers]

Larry Lamers reported that he had moved the SPI-2 document into Framemaker.

John Lohmeyer mentioned that the SPI-2 editing session February 6th had polished some wording regarding the 100 ms delays following power on and bus mode changes. Very little else was addressed.

Due to the late hour, this topic was deferred to the next meeting.

12.   Bus Set Delay Reduction (97-116) [Ham]

John Lohmeyer reported for Symbios that some old silicon will have a problem with a reduction in Bus Set Delay, but new silicon will have no problem with the 200 ns. reduction Bill originally proposed. Norm Harris reported a similar opinion for Adaptec. George Penokie indicated that he would need more time to review the proposal with his engineers.

Skip Jones suggested that the lower value be tied to a negotiated bus transfer period value or an operating mode, e.g. LVD. John Lohmeyer and Larry Lamers described how the bus set delay affects arbitration, which has no functional tie to bus speed. The group discussed the history of similar changes in SCSI.

Larry asked that the committee 1) define a mechanism for insuring that the bus set delay is known, and 2) work to lower bus set delay and arbitration overhead as much as possible. The group discussed this viewpoint at length, however, no clear resolution was reached.

13.   Hot-Plugging Data (97-144r0) [Ham]

Bill presented data showing glitches produced by hot-plugging in laboratory tests. While preliminary, the device under test did not respond to the hot plugging glitches.

In response to questions from the group, Bill provided details of how the tests were conducted. Bill said that additional tests are necessary and agreed to report information to the group at the next bi-monthly meeting.

14.   REQ/ACK Glitch Filters [Ham]

Bill Ham raised concerns about coordinating REQ/ACK counting and data latching. He expressed the worry that the use of different circuits for the two tasks can cause the two functions to be performed differently. The group discussed Bill's concerns. Some group members worried that attempts to address the problem by making changes in the standard would result in the standard specifying a specific implementation. Bill suggested that

specifying a noisy signal and the parameters of how a receiver must respond to that signal might produce the desired results.

The group also discussed REQ/ACK Offset. Bill noted that, for optimal performance, REQ/ACK Offset needs to double every time the basic bus speed doubles. Otherwise, the synchronous transfers will stall due to inadequate FIFO space. Some group members objected to Bill's assertion, since large FIFOs can be expensive.

Based on a request made at the January meeting, George Penokie asked that the group consider defining a range on the time interval that glitch filtering is applied. For example, he requested a range of 6-10 ns. for 10 mega-transfers, 4-7 ns. for 20 mega-transfers, and 1-4 ns. for 40 mega-transfers. John Lohmeyer recalled that the numbers discussed at the January were intended to be minimums and that the maximum is what ever can be done up to the point where the device fails to meet its setup and hold times. This returned the numbers to the 10 ns., 7 ns., and 4 ns. numbers discussed at the January meeting.

15.   Meeting Schedule

The group decided to cancel the planned meeting of SPI-2 Editors previously scheduled for Thursday April 10, 1997. However, a working group meeting to discuss Ultra3 SCSI issues was scheduled on Friday April 18, 1997 in San Jose, hosted by Norm Harris of Adaptec. A subsequent general SPI-2 working group meeting was scheduled for Monday May 5, 1997 in Natick, MA.

16.   Adjournment

The meeting was adjourned at 4:50 p.m. on Monday March 10, 1997.