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

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| **Doc. No.:** | T10/98-212r1 |
| **Date:** | September 29, 1998 |
| **Reply to:** | John Lohmeyer |

To:       T10 Membership
From:     Ralph Weber / John Lohmeyer
Subject:  SPI-3 Working Group Meeting -- September 15, 1998
          St. Petersburg Beach, FL

# Agenda

1. Opening Remarks
2. Approval of Agenda
3. Attendance and Membership
4. SPI-3 Topics
    4.1  CRC Proposal (98-177r5)
    4.2  Domain Validation (98-184, -189)
    4.3  QAS (97-199r9, 98-133r0, 98-159r2) [Moore, Penokie]
    4.4  Parallel Protocol Request Negotiation (98-180r3) [Penokie]
    4.5  Fast-80 Proposal (98-153r5) [Milligan]
    4.6  SPI-3 Concerns (98-197r0, 98-219r0) [Daggett]
    4.7  Staged Contact Resistance (98-174) [Herrmann]
    4.8  Load Compensation (97-281) [Novak]
    4.9  Universal Backplane Annex (98-101) [Wallace]
    4.10 Bias Reduction Proposal (98-156) [Bridgewater]
    4.11 InterSymbol Interference (98-199) [Penman]
    4.12 Penokie's 'forgotten' issues (reflector message)
    4.13 'Small' change to single-ended termination current (98-220r0) [Grantham]
    4.14 Long Cables and Backplanes [Ham/Penman]
    4.15 INQUIRY data field to report transceiver types (98-215r0) [Lohmeyer]
5. Meeting Schedule
6. Adjournment

# Results of Meeting

## 1.   Opening Remarks

John Lohmeyer, the T10 Chair, called the meeting to order at 9:10 a.m., Tuesday September 15, 1998.  He thanked Chuck Brill 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:

    4.1       CRC Proposal (98-177r5)

The following agenda items were added during the course of the meeting:

    4.14      Long Cables and Backplanes [Ham/Penman]
    4.15      INQUIRY data field to report transceiver types (98-215r0) [Lohmeyer]

## 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. Martin L. Sodos    O  Advansys                 msodos@advansys.com
Mr. Charles Brill      P  AMP, Inc.                cebrill@amp.com
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Mr. Robert C. Elliott  P  Compaq Computer Corp.    Robert.Elliott@compaq.com
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Mr. Ed Kavetsky        A# Distributed Processing   kavetsky@dpt.com
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Mr. Ben-Koon Lin       A  Fujitsu (FCPA)           blin@fcpa.fujitsu.com
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Mr. Zane Daggett       P  Hitachi Cable Manchester, zdaggett@hcm.hitachi.com
                          Inc
Mr. George Penokie     P  IBM Corp.                gop@us.ibm.com
Mr. Louis Grantham     P  Linfinity Micro          lgrantham@linfinity.com
Mr. Paul Pickle        V  Linfinity Micro          ppickle@linfinity.com
Mr. John Lohmeyer      P  LSI Logic Corp.          lohmeyer@ix.netcom.com
Mr. Alan Littlewood    A  LSI Logic Corp.          alanl@lsil.com
Mr. Ralph O. Weber     A# LSI Logic Corp.          roweber@acm.org
Mr. Andrew Brown       V  LSI Logic Corp.          andrew.brown@lsil.com
Mr. David Steele       V  LSI Logic Corp.          david.steele@lsil.com
Mr. Steve Stefek       V  LSI Logic Corp.          steve.stefek@lsil.com
Mr. Makesh             V  Lucent Technologies      makesh@lucent.com
Kothandaraman
Mr. Robert Bellino     P  Madison Cable Corp.      rbellino@madisoncable.com
Mr. Jay Neer           A  Molex Inc.               jneer@molex.com
Mr. Martin Ogbuokiri   A# Molex Inc.               mogbuokiri@molex.com
Mr. Chuck Micalizzi    O  QLogic Corp.             c_micalizzi@qlc.com
Mr. Dean Wallace       V  QLogic Corp.             d_wallace@qlc.com
Mr. James McGrath      A# Quantum Corp.            JMCGRATH@QNTM.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.
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Mr. Gerald Houlder     A  Seagate Technology       Gerry_Houlder@notes.
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                                               seagate.com
Mr. Daniel (Dan) F.   O  Seagate Technology    daniel_f_smith@notes.
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                                               com
Mr. Dave Guss         P  Silicon Systems, Inc. dave.guss@tus.ssi1.com
Mr. Henry Kuo         O  Silicon Systems, Inc. tkuoh@tus.ssi1.com
Mr. Frank Ng          V  Sun Microsystems      franklin.ng@sun.com
                         Computer Co
Mr. Paul D. Aloisi    P  Unitrode Corporation  aloisi@unitrode.com
Mr. Jeffrey L.        P  Western Digital       Jeffrey.L.Williams@wdc.
Williams                 Corporation           com

38 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  CRC Proposal (98-177r5)

Jim McGrath introduced 98-177r5 and two new documents (98-217r0 and 98-218r0) that summarize the remaining issues in the 177r5 document.  The two major issues are whether 8-bit support should be defined for double transition clocking and whether support for single-ended should be included in SPI-3.  Minor issues are the usage of the P1 signal and what value should be defined for the pad bytes.

A straw poll was taken on bus width support for Double Transition clocking:

Vote    Option
20      A1) 32- and 16-bit support only.  8-bit support forbidden.
0       A2) 32- and 16-bit support only.  Document silent on 8-bit support.
3       A3) 32- and 16-bit support recommended. 8-bit support allowed.
4       A4) 32- and 16- and 8-bit support allowed.

John Lohmeyer pointed out that he voted for option 1 with the understanding that nothing would be done to require the usage of the P1 signal for DT clocking.  This would allow us to change our minds later should 8-bit support become desirable.

The discussion turned to single-ended support.  Another straw poll was taken:

Vote    Option
22      A1) LVD only.  Single-ended forbidden.
0       A2) LVD only.  Document silent on single-ended support.
1       A3) LVD recommended and single-ended allowed.
0       A3) LVD and single-ended allowed.

A straw poll on P1 usage in DT mode was taken:

Vote    Option
0       C1) the current wording indicating that P1 is used for 16-bit parity
1       C2) new wording indicating that the signal is reserved for future use
20      C3) signal negated by the driver and ignored by the receiver

The pad byte value was discussed and a straw poll was taken:

Vote    Option
0       D1) pad bytes are 00
16      D2) pad bytes may be anything

The working group unanimously recommended that the plenary approve 98-177r6, which includes the results of the straw polls, for incorporation into SPI-3.

### 4.2  Domain Validation (98-184, -189)

Larry Lamers reported on discussions related to DMTF (Desktop Management Task Force) as they apply to SCSI transfer parameters and modes and domain validation.  He then reviewed the READ/WRITE BUFFER proposal for domain validation (98-184r1).  He noted that domain validation can detect some data integrity problems and miss others.  He noted where the DMTF wording had been added to the proposal and that margin testing been added to the proposal at the request of LSI Logic and others.

The CDB fields associated with the margin testing description were not defined to the satisfaction of all present.  The group discussed how best to define the margin testing and adjustment mechanisms.

It was noted that the proposal actually is against SPC-2, SPI-3.  This topic will be moved to the general working group agenda next time.

### 4.3  QAS (97-199r9, 98-133r0, 98-159r2) [Moore, Penokie]

The group agreed to recommend that the plenary accept QAS for inclusion in the SPI-3 working draft.

### 4.4  Parallel Protocol Request Negotiation (98-180r3) [Penokie]

George Penokie led the group in a discussion of 98-180r3.  The group agreed to make a few changes.  George agreed to bring a revised proposal to the next meeting.

### 4.5  Fast-80 Proposal (98-153r5) [Milligan]

Gene Milligan presented 98-153r5.

The change to delete the note 2 in Table 1 that said, "This is a recommended time. It is not mandatory." met with some resistance.  George Penokie observed that many SCSI devices cannot meet even the 10 second recommendation for time after power on before the device responds to selection.  Gene agreed to rescind the draft changes in Table 1.

A new definition, Receive Period, was changed to REQ/ACK Period.  After reviewing all the definitions, Gene asked for responses to the "homework assignment."  Recommendations for 0.6 ns Transmit Period Tolerance and 0.7 ns Receive Period Tolerance were accepted with little discussion.

Gene Milligan moved that the working group recommend 98-153r6 (r5 as revised) be accepted for inclusion in SPI-3.  George Penokie seconded the motion.  The vote passed, 11:3.  Chuck Micalizzi from Qlogic stated that his no vote was based an objection to the inclusion of 98-153 in SPI-3 at this time because several of the definitions have been redefined without a chance to review or comment on these definitions.

### 4.6 SPI-3 Concerns (98-197r0, 98-219r0) [Daggett]

Zane Daggett presented a series of specific concerns in the draft SPI-3 text.  The recommendation regarding the use of "Characteristic Impedance" Tables 15 and 16 were accepted and "Transmission Line Impedance" was agreed as replacement wording.  It was further agreed to use the Fast-40 numbers in place of the N/A entries in Table 16.

Lastly, Zane noted that a new statement regarding attenuation is called for in clause 6.2 and that Annex F should be replaced by a completely new testing description.

Zane then presented an outline for the new testing annex (98-219r0).

### 4.7 Staged Contact Resistance (98-174) [Herrmann]

At the voice-mail request of Hank Herrman, discussion of this topic was deferred to the November meeting.

### 4.8 Load Compensation (97-281) [Novak]

In the absence of Vit Novak, discussion of this topic was deferred to the November meeting.

### 4.9 Universal Backplane Annex (98-101) [Wallace]

George Penokie plans to include a revised version of Dean's draft annex in SPI-3 rev 1 as an informative annex.

### 4.10 Bias Reduction Proposal (98-156) [Bridgewater]

Since Wally Bridgewater could not attend, discussion of this topic was deferred to the November meeting.

### 4.11 InterSymbol Interference (98-199) [Penman]

In the absence of Duncan Penman, discussion of this topic was deferred to the November meeting.

### 4.12 Penokie's 'forgotten' issues (reflector message)

In going through the minutes of the last three SPI-3 working groups it appears that a few issues seems to have disappeared without getting a resolution. They are:

Reducing the stub length from 10 cm to 5 cm or 6 cm except for devices that contain non-disabled terminators.  It was agreed to not reduce the stub length at this time.

Restricting, in some way, system configurations that use multi-mode terminators.  It was agreed to make no changes at this time.

The question of whether pad bytes should be reserved (i.e. zero) or ignored (i.e. vendor specific).  A vote earlier in the day resulted in the pad bytes being vendor specific (see 4.1).

### 4.13 'Small' change to single-ended termination current (98-220r0) [Grantham]

Louis Grantham described an incompatibility between SCSI-2, SPI, and SPI-2 single-ended termination current requirements and proposed a change for SPI-3 (98-220r0).  It was noted that all the terminator companies had agreed to the previous values.  However, Louis pointed out that a terminator company is requesting the change and that the change has no effect on drivers.

Louis Grantham moved that the working group recommend that T10 accept 98-220r0 be accepted for inclusion in SPI-3.  Dave Guss seconded the motion.  The motion passed 10:3:3.  Paul Aloisi stated that his no vote was based on the previous agreements to the current definition with all the terminator companies.  The change allows non-linear terminators, which have been a problem in the past, and leaves no margin for drivers; the terminators take the maximum current the drivers put out and there is no margin for receiver leakage current.

**Chair's note:** T10 reviewed this proposal and deferred consideration until the November meeting so that the November SPI-3 WG can review it further (see 98-226 and 98-214, item 10.4.3).

### 4.14 Long Cables and Backplanes [Ham/Penman]

Bill Ham described data presented by Duncan Penman in July as unbelievably good.  Bill then reported that attempts to reproduce the data presented in July have been unsuccessful and that the new results have been, in some cases, even worse than other data Bill has seen.  Bill concluded by noting that LVD expanders still have a place in the world.

### 4.15 INQUIRY data field to report transceiver types (98-215r0) [Lohmeyer]

John Lohmeyer noted that the introduction of translating expanders could result in differences in driver/receiver mode between the initiator and target.  This could be of value in domain validation.  As a result, John produced a proposal to report transceiver information in the standard INQUIRY data (98-215r0).  Concerns were raised about the usefulness of the proposed data, in light of other information that should be available to the initiator.  A straw poll favored further consideration of the proposal 11:6.

**Note:** The general working group on the next day was not nearly so agreeable; John withdrew the proposal there.

## 5.  Meeting Schedule

The next meeting of SPI-3 Working Group will be Tuesday, November 3, 1998 from 9 a.m. to 6 p.m. in Palm Springs, CA hosted by Adaptec, Inc. at the Hyatt Regency Suites Hotel (619-322-9000).

## 6.  Adjournment

The meeting was adjourned at 6:05 p.m. on Tuesday September 15, 1998.