

Accredited Standards Committee\*

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

<b>Doc. No.:</b> T10/98-200r0
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**Date:** July 15, 1998

**Reply to:** John Lohmeyer

To: T10 Membership  
From: Ralph Weber / John Lohmeyer  
Subject: SPI-3 Working Group Meeting -- July 14, 1998  
Portland, ME

## Agenda

1. Opening Remarks
2. Approval of Agenda
3. Attendance and Membership
4. SPI-3 Topics
  - 4.1 CRC Proposals
  - 4.2 Domain Validation
  - 4.3 QAS
  - 4.4 Parallel Protocol Request Negotiation (98-180r1) [Penokie]
  - 4.5 Fast-80 Proposals
  - 4.6 SPI-3 Concerns (98-197r0) [Daggett]
  - 4.7 Staged Contact Resistance (98-174) [Herrmann] {September Meeting}
  - 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 Dual Clocking Proposal (97-208) [Bastiani]
  - 4.12 Test results on dual edge signals (98-113r0) [Bastiani]
  - 4.13 InterSymbol Interference (98-199) [Penman]
5. SPI-2 Issues
  - 5.1 Corrections in SPI-2 Revision 20b (98-204) [Penokie]
  - 5.2 Typo in Figure 27 of SPI-2 (Reflector Message)
  - 5.3 Synchronous data transfer description in SPI-2 [Elliott]
6. EPI Issues
7. Meeting Schedule
8. Adjournment

## Results of Meeting

### 1. Opening Remarks

John Lohmeyer, the T10 Chair, called the meeting to order at 9:00 a.m., Tuesday July 14, 1998. He thanked Doug Hagerman of Compaq for hosting the meeting (arranged by Charles Monia when he was still with Digital).

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

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**NCITS Secretariat, Information Technology Industry Council (ITI)**  
1250 Eve Street NW. Suite 200. Washington. DC 20005-3922

## 2. Approval of Agenda

The draft agenda was approved with the following additions and changes:

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

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

### 5. SPI-2 Issues

5.1 Corrections in SPI-2 Revision 20b (98-204) [Penokie]

5.2 Typo in Figure 27 of SPI-2 (Reflector Message)

5.3 Synchronous data transfer description in SPI-2 [Elliott]

6. EPI Issues

## 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. Richard Moore	A#	Adaptec, Inc.	richard_moore@corp.adaptec.com
Mr. Michael Wingard	P	Amphenol Interconnect	mikwingard@aol.com
Mr. Edward Haske	O	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.com
Mr. Greg McSorley	P	Data General / Clariion	greg_mcsorley@dg.com
Mr. Roger Cummings	P	Distributed Processing Tech.	cummings_roger@dpt.com
Mr. I. Dal Allan	P	ENDL	endlcom@ibm.net
Mr. Tom Jackson	P	Exabyte Corp.	thomasj@exabyte.com
Mr. Frank Wang	A	Exabyte Corp.	frankw@exabyte.com
Mr. George Penokie	P	IBM Corp.	gop@us.ibm.com
Mr. Dennis Moore	P	KnowledgeTek, Inc.	dmoore@ix.netcom.com
Mr. Alan Littlewood	P	LSI Logic Corp.	alanl@lsil.com
Mr. Martin Ogbuokiri	V	Molex	mogbuoki@molex.com
Mr. Jay Neer	A	Molex Inc.	jneer@molex.com
Mr. Brian McKean	P	Mylex Corp.	brianm@mylexboulder.com
Mr. Douglas J. Baloun	V	Mylex Corp.	dbaloun@mylex.com
Mr. Chuck Micalizzi	O	QLogic Corp.	c_micalizzi@qlc.com
Mr. Patrick McGarrah	P	Quantum Corp.	pat.mcgarrah@quantum.com
Mr. Richard Uber	V	Quantum Corp.	duber@tdh.qntm.com
Mr. Duncan Penman	V	Quantum Corp.	duncan.penman@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. Daniel (Dan) F. Smith	O	Seagate Technology	daniel_f_smith@notes.seagate.com

Mr. Mayank R. Patel	V	Seagate Technology	patel@cdg.stsv.seagate.com
Mr. Dave Guss	P	Silicon Systems, Inc.	dave.guss@tus.ssil.com
Mr. Erich Oetting	P	Storage Technology Corp.	erich_oetting@stortek.com
Mr. Vit Novak	A	Sun Microsystems, Inc.	vit.novak@sun.com
Mr. John Lohmeyer	P	Symbios, Inc.	lohmeier@ix.netcom.com
Mr. Ralph O. Weber	A	Symbios, Inc.	roweber@acm.org
Mr. Andrew Brown	V	Symbios, Inc.	andrew.brown@symbios.com
Mr. David Steele	V	Symbios, Inc.	david.steele@symbios.com
Mr. Ken Plourde	O	Temp Flex Cable, Inc.	kplourde@templex.com
Mr. Kenneth J. Hallam	P	UNISYS Corporation	ken.hallam@unisys.com
Mr. Paul D. Aloisi	P	Unitrode Corporation	aloisi@unitrode.com
Mr. Jeffrey L. Williams	P	Western Digital Corporation	Jeffrey.L.Williams@wdc.com

39 People Present

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

## 4. SPI-3 Topics

At the request of Bill Ham, George Penokie reported that SPI-3 revision 0 contains SPI-2 plus the packetized protocol and is available on the T10 web site.

### 4.1 CRC Proposals

Pat McGarrah presented 98-177r3, a proposal to increase transfer rate and improve error detection. He noted that the changes in this revision are based on comments from the June 19 meeting (minutes in 98-190). The group discussed several changes in the proposal, and concluded that the document is nearing completion. Pat agreed to provide revision 4 of the proposal for the next T10 mailing.

### 4.2 Domain Validation

Pat McGarrah noted that his domain validation proposal has not been revised recently. He stated that his plans for the disposition of his proposal will depend on the work done on other domain validation proposals.

Larry Lamers presented 98-189 a description of the ideas found in formal proposal 98-184. Larry noted that his proposal should be viewed as in addition to Pat's proposal, not in opposition to it. In broad overview, Larry's proposal uses the READ BUFFER and WRITE BUFFER commands for passing domain validation data.

After discussing the proposal and the motivations behind it, Larry described a test setup where he can test methods for validating a domain. He noted that 128 bytes are not a sufficient amount of data to validate a marginal domain. A broken domain can be validated with a small number of test bytes, but not a marginal domain.

### 4.3 QAS

George Penokie led the group in a discussion of how to validate whether the proposed usage of 55h would work; that is, be detectable and not be incorrectly detected. Richard Moore volunteered to arrange the lab testing necessary to develop some baseline tests, to show that it can work. Bill Ham proposed stress testing as a second step, with the desire that functional margins be established.

Jeff Williams reminded the group that the fairness issues discussed in past meetings need to be revisited. George noted that he has some editorial issues, which he will address, while preparing a future revision of the proposal.

#### **4.4 Parallel Protocol Request Negotiation (98-180r1) [Penokie]**

George Penokie led the group in a discussion of the proposal that defines the transfer request message used to negotiate the transfer parameters associated with planned SPI-3 capabilities. Much effort was required to get everyone accustomed to the double clocking notation and terminology, as contained in the proposal. It was noted that the negotiation wording (George's proposal) and physical definitions wording (Gene Milligan's proposal) need to be coordinated. George agreed to perform the coordination as technical editor for SPI-3.

George stated a belief that DT (double clocking) should be disallowed on an 8-bit (narrow) bus, and asked the group to present counter opinions. A straw poll supported George's position 8 to 4.

George agreed to prepare a revised 98-180 for the next meeting based on inputs from this meeting.

#### **4.5 Fast-80 Proposals**

Gene Milligan presented 98-153r3 and reviewed the open issues listed on the first page of the proposal. Several concerns were raised regarding issue 1; changing a recommendation to a requirement bothered several people. Gene accepted several corrections to proposal for revision 3.

Gene presented transmitter and receiver timing diagrams and the group discussed possible changes to the timing diagrams in SPI-2 with an emphasis on how the diagrams may need modifications in SPI-3.

Gene agreed to prepare a new revision of 98-153 for the next meeting.

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

In the absence of Zane Daggett, John Lohmeyer read the document to the group. One or more members of the group disagreed with most of the proposed changes. These items will be deferred until Zane is present to defend his position. The only agreed changes were removal of nominal values and a maximum difference value in Table 16.

During a discussion of cable testing, Bill Ham agreed to contact Zane and to discuss what specific proposal could be written for inclusion in SPI-3.

#### **4.7 Staged Contact Resistance (98-174) [Herrmann] {September Meeting}**

John Lohmeyer noted that discussion of this topic has been deferred to the September meeting.

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

Vit Novak reviewed the concept of compensating for device capacitance using inductance on the backplane that he presented in detail two meetings ago. Vit asked the group for guidance regarding the usefulness of the concept and where the information might be presented. Several people suggested that the information should be included in an annex to SPI-3.

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

In the absence of Dean Wallace, this item was deferred to the September meeting.

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

In the absence of Wally Bridgewater, this item was deferred to the September meeting.

#### **4.11 Dual Clocking Proposal (97-208) [Bastiani]**

Vince Bastiani requested that this topic be dropped from this and future agendas since it is included in the Milligan proposal.

#### **4.12 Test results on dual edge signals (98-113r0) [Bastiani]**

Vince Bastiani requested that the information concerning this topic be distributed on the web site and discussed on the T10 Reflector. John Lohmeyer requested that Vince prepare a document and email it to him, John volunteered to post the document on the ftp/web site. He asked that only a short notice of the proposal's availability be distributed on the T10 Reflector.

#### **4.13 InterSymbol Interference (98-199) [Penman]**

Duncan Penman presented some ISI studies on a Fast-80 bus. For the particular test cases presented, the results were not alarming. Duncan agreed to pursue the ideas discussed by the group, with an eye toward the potentially more troublesome issues, and gather more data.

### **5. SPI-2 Issues**

#### **5.1 Corrections in SPI-2 Revision 20b (98-204) [Penokie]**

George presented a list of changes between SPI-2 revisions 20a and 20b (98-204r0). The group agreed that none of the changes listed should be considered substantive.

#### **5.2 Typo in Figure 27 of SPI-2 (Reflector Message)**

Via a T10 Reflector message on May 27th, Bruce McLaren identified an editorial error in Figure 27. George reported that the typo has been corrected and is listed in 98-204r0.

#### **5.3 Synchronous data transfer description in SPI-2 [Elliott]**

George Penokie reported that in the synchronous data transfer clause (11.1.5.2) the last two paragraphs on page 109 were taken from SCSI-2 not SPI. George described the differences between the two wordings. Questions were raised about the numeric timing results from substituting the timing values for the name-based time computations given in the SCSI-2 and SPI descriptions. It was concluded that the SCSI-2 times are between twice and four times as large as the SPI times, and this was thought to be intentional for SPI.

It was agreed that product designers need to examine all the numbers carefully, to see if there are any problems. If he had time, George planned to study the issue and give a proposed resolution at the SCSI working group meeting the next day (see T10/98-201).

### **6. EPI Issues**

In the absence of any opposition, the working group unanimously recommended that EPI revision 15 (revision 14 as revised by the EPI editing meeting) be processed toward first public review by T10.

## **7. Meeting Schedule**

The next meeting of SPI-3 Working Group will be Tuesday, September 15, 1998 from 9 am to 6 pm in St. Petersburg Beach, FL hosted by AMP, Inc. at the Tradewinds Hotel (800-808-9833 / 813-367-6461).

## **8. Adjournment**

The meeting was adjourned at 5:10 p.m. on Tuesday July 14, 1998.