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Reply to: John Lohmeyer

To: Membership of T10

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

Subject: Minutes of Fast-xx Study Group and SPI-2 Working Group
September 8, 1997 -- Nashua, NH

Agenda

1. Opening Remarks
2. Approval of Agenda
3. Attendance and Membership
4. Fast-xx Study Group {Monday Morning}
 - 4.1 Low-Attenuation Cables (97-213, 97-228) [Rogers, Bellino]
 - 4.2 Cable Attenuation & Margin Budget Analysis at 80 MHz (97-207) [Gintz]
 - 4.3 Bias Reduction Proposal (97-214) [Bridgewater]
 - 4.4 Dual Clocking Proposal (97-208) [Bastiani]
5. SPI-2 Working Group {Monday Afternoon}
 - 5.1 SPI-2 specifications on interconnect (97-235) [Ham]
 - 5.2 SPI-2 Issues For the September working Group and Plenary Vote
 - 5.2.1 0.5 pF balance capacitance for LVD SCSI (Table 29 SPI-2R13) (97-236) [Aloisi]
 - 5.2.2 Terminator current differences between SCSI-2 and SPI/Fast-20 (97-236r1) [Aloisi]
 - 5.3 Single-ended termination (96-245r2 and 97-174r0) [Wallace]
 - 5.4 Capacitance Measurement at 2 Volts [Wallace] {November Meeting}
 - 5.5 Universal Backplane Annex (97-121r0) [Wallace] {November Meeting}
 - 5.6 REQ/ACK Glitch Filters [Ham]
 - 5.7 Latching and Counting (97-182) [Ham]
 - 5.8 Double ACK [Ham]
 - 5.9 SPI-2 Revision 14 Review [Penokie]
6. Meeting Schedule
7. Adjournment

Results of Meeting

1. Opening Remarks

John Lohmeyer, the T10 Chair, called the meeting to order at 9:00 a.m., Monday September 8, 1997. He thanked Paul Aloisi and Unitrode 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 agenda was approved without additions and changes.

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. Jim Pilny	V	3M	jcpilny@mmm.com
Mr. Lawrence J. Lamers	P	Adaptec, Inc.	ljlammers@ix.netcom.com
Mr. Vincent Bastiani	A#	Adaptec, Inc.	bastiani@corp.adaptec.com
Mr. Tak Asami	V	Adaptec, Inc.	asami@itc.adaptec.com
Mr. Tom Schneider	V	Adaptec, Inc.	schneid@itc.adaptec.com
Mr. Michael Wingard	P	Amphenol Interconnect	mikwingard@aol.com
Mr. Ron Roberts	A	Apple Computer	rkroberts@aol.com
Mr. Richard Wagner	P	Cable Design Technologies	rwagner@montrose-cdt.com
Mr. Edward Haske	P	CMD Technology	haske@cmd.com
Mr. Bill Galloway	O	Compaq Computer Corp.	Bill.Galloway@compaq.com
Mr. Michael Smith	A	Dallas Semiconductor	mike.smith@dalsemi.com
Mr. Greg McSorley	P	Data General / Clariion	greg_mcsorley@dgc.ceo.dg.com
Mr. Joe Salamone	V	FCI	jsconnect@adi.com
Mr. Don Vohar	A	Fujitsu (FCPA)	dvohar@fcpa.fujitsu.com
Mr. Philip Facendola	O	Helix/Hitemp Cables, Inc.	
Mr. Zane Daggett	P	Hitachi Cable Manchester, Inc	zdaggett@hcm.hitachi.com
Mr. Kirk Rogers	A	Hitachi Cable Manchester, Inc	krogers@hcm.hitachi.com
Mr. Anthony Yang	P	Hitachi Storage Products	yang_a@halsp.hitachi.com
Mr. George Penokie	P	IBM Corp.	gop@us.ibm.com
Mr. Alan Littlewood	P	LSI Logic Corp.	alanl@lsil.com
Mr. Robert Bellino	P	Madison Cable Corp.	robert_bellino@madisonusa.ccmil.compuserve.com
Mr. Skip Jones	P	QLogic Corp.	sk_jones@qlc.com
Mr. Richard Uber	V	Quantum Corp.	duber@tdh.qntm.com
Bruce Leshay	V	Quantum Corp.	bleshay@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. Daniel (Dan) F. Smith	O	Seagate Technology	daniel_f_smith@notes.seagate.com
Mr. Dave Guss	P	Silicon Systems, Inc.	dave.guss@tus.ssil.com
Mr. John Lohmeyer	P	Symbios Logic Inc.	john.lohmeyer@symbios.com
Mr. Ralph O. Weber	A	Symbios Logic Inc.	roweber@acm.org
Mr. Graeme Weston-Lewis	V	Symbios Logic Inc.	gwl@symbios.com

Mr. Peter Baril	V	Temp-Flex Cable, Inc.	
Mr. Rick Hardy	O	The JPM Company	rhardy@jpmsj.com
Mr. Kenneth J. Hallam	P	UNISYS Corporation	ken.hallam@unisys.com
Mr. Paul D. Aloisi	P	Unitrode Corporation	aloisi@unitrode.com
Mr. Gregory Kapraun	V	Western Digital Corp.	Gregory.D.Kapraun@wdc.com

36 People Present

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

4. Fast-xx Study Group {Monday Morning}

4.1 Low-Attenuation Cables (97-213, 97-228) [Rogers, Bellino]

The group discussed general willingness to accept the conditions of low-attenuation cables, and the relationship of dual-edge clocking to low-attenuation cables. Much of the discussion was a review of ideas proposed at the last meeting. The group seemed to be leaning toward the use of dual-edge clocking and Fast-80 (over Fast-100).

Zane Daggett said that Hitachi Cable is planning to bring additional low-attenuation cable data to the November meeting. John Lohmeyer noted that 97-228 on Lower Attenuation Cables had been received from Madison Cable after the last study group meeting and was in the last mailing.

4.2 Cable Attenuation & Margin Budget Analysis at 80 MHz (97-207) [Gintz]

Vince Bastiani requested that discussion of this topic be deferred to the November meeting.

4.3 Bias Reduction Proposal (97-214) [Bridgewater]

Vince Bastiani requested that discussion of this topic be deferred to the November meeting.

4.4 Dual Clocking Proposal (97-208) [Bastiani]

Vince Bastiani requested that discussion of this topic be deferred to the November meeting.

5. SPI-2 Working Group {Monday Afternoon}

5.1 SPI-2 specifications on interconnect (97-235) [Ham]

Because Bill Ham was called away for an emergency, discussion of this topic was deferred to the SCSI Working Group meeting. See minutes in 97-238.

5.2 SPI-2 Issues For the September working Group and Plenary Vote

5.2.1 0.5 pF balance capacitance for LVD SCSI (Table 29 SPI-2R13) (97-236) [Aloisi]

Paul Aloisi presented a proposal (97-236r1) that the requirement on capacitance difference between differential signal lines be increased from 0.5 pF to 2.0 pF or (possibly 1.0 pF). Greg Kapraun presented data (97-243r0) where 0.5 pF, 3.0 pF, and 10.0 pF capacitances were added to one side of a signal in one drive of fourteen in a complex configuration. Greg's data showed little difference in the 0.5 pF and 3.0 pF cases. Greg planned to collect more data including the effects of distributing the capacitance over several drives.

It was agreed that no changes should be made to SPI-2 until more data are available.

5.2.2 Terminator current differences between SCSI-2 and SPI/Fast-20 (97-236r1) [Aloisi]

Paul Aloisi proposed a specific wording change in item b in clause 7.1.1. George Penokie asked that the group recommend the proposed wording change to the plenary. In the absence of any objections, the group recommended that the plenary approve the change.

5.3 Single-ended termination (96-245r2 and 97-174r0) [Wallace]

This issue is essentially the same as in 5.2.2. If Paul's proposal is accepted by the plenary, this item may be moot. In the absence of Dean Wallace, the group agreed to carry this item over to the November meeting.

5.4 Capacitance Measurement at 2 Volts [Wallace] {November Meeting}

Dean was unable to attend. By email, he asked John to defer this topic to the November meeting.

5.5 Universal Backplane Annex (97-121r0) [Wallace] {November Meeting}

Dean was unable to attend. By email, he asked John to defer this topic to the November meeting.

5.6 REQ/ACK Glitch Filters [Ham]

Because Bill Ham was called away for an emergency, discussion of this topic was deferred to the SCSI Working Group meeting. See minutes in 97-238.

5.7 Latching and Counting (97-182) [Ham]

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5.8 Double ACK [Ham]

Because Bill Ham was called away for an emergency, discussion of this topic was deferred to the SCSI Working Group meeting. See minutes in 97-238.

5.9 SPI-2 Revision 14 Review [Penokie]

Gene Milligan asked that references to EIA standards be replaced with IEC references. Bill Ham volunteered to locate the applicable IEC references, if they exist. A problem was discovered where multi-wipe connectors requirements are described. Contrary to obvious committee choices (i.e., several long-supported connectors are single wipe), revision 14 appears to require that all connectors be multi-wipe. George agreed to fix the offending wording.

Gene Milligan noted that the definition of 'current task' failed to account for the message phases. It was noted that the definition of 'current task' comes from SAM. Larry Lamers noted that SPI-2 is obliged to expand the definition of 'current task' to fit the parallel bus. George agreed that such a change was needed and appropriate.

Bill Ham volunteered find an IEC reference for EIA 364-23A (low-level contact resistance test procedure for electronic connectors).

The group spent a substantial amount of time trying to handle various mixed-mode support cases in Table 14. Among the issues were concerns over the recommended wire gauge values. Bill Ham cited several specific cases where the recommendations were too permissive. Bill agreed to bring a proposal for wording that avoids mention of wire gauges to the next meeting.

Bill Ham asked that clause 6 have the title changed from "SCSI bus cables" to "SCSI interconnects". His point was that backplane interconnects and other options are possible, not just cables. The group agreed that a change is necessary and made several changes to the first page of the clause to effect the change.

Bill Ham, Gene Milligan, Paul Aloisi, and George Penokie agreed that improved attenuation data should be added to SPI-2.

The group discussed the cases around mixing HVD and other signaling modes with concerns around the conditions that might fry receivers. Eventually, it was concluded that the cases might not be as numerous as originally thought. George agreed to add a couple of informative and cautionary notes.

The group discussed many other aspects of SPI-2 and George took many notes regarding corrections and agreed to provide a new revision of SPI-2 in the near future. George requested that an editing meeting be scheduled for SPI-2, sometime between now and November. The group agreed to discuss the editing schedule at the SCSI Working Group meeting and the Plenary.

6. Meeting Schedule

The next meeting of Fast-xx Study Group and SPI-2 Working Group will be November 3, 1997, in Palm Springs, CA at the Hyatt Regency Suites Hotel (619-322-9000), hosted by Adaptec.

7. Adjournment

The meeting was adjourned at 6:15 p.m. on Monday September, 1997.