

Accredited Standards Committee*

National Committee for Information Technology Standards (NCITS)

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Date: March 17, 1999

Reply to: John Lohmeyer

To: T10 Membership
From: Ralph Weber / John Lohmeyer
Subject: T10 Plenary Meeting #30 -- March 11, 1999
Harrisburg, PA

Agenda

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- 10.1.5 Synchronous Transfer Timeout Function in SPC-2 (99-102r5) [Lamers]
- 10.1.6 Message Information Unit Definition in SPI-3 (99-104r1) [Penokie]
- 10.1.7 Clarification of SDTR/WDTR and PPR interaction in SPI-3 (99-108r3) [Lohmeyer]
- 10.1.8 Synchronous ATN Timing in SPI-3 (99-112r2) [Galloway]
- 10.1.9 DIFFSENS Timing in SPI-3 (99-113r2) [Galloway]
- 10.1.10 30 mV vs. 60 mV in figures 44 and 45 in SPI-3 (99-127r4) [Aloisi]
- 10.1.11 No zero length data in SPI-3 (99-132r0) [Galloway]
- 10.1.12 Timing for SCSI RST line in SPI-3 (99-133r0) [Galloway]
- 10.1.13 PPR negotiation changes in SPI-3 (99-134r1) [Galloway]
- 10.1.14 DT CRC Description in SPI-3 (99-157r1) [Leshay]
- 10.1.15 Very Long CDBs in SPI-3 and FCP-2 (99-158r0) [Snively]
- 10.1.16 Very Long CDBs in SAM-2 and SPC-2 (98-188r2) [Houlder]
- 10.1.17 Version numbers in SPC-2 (99-110r1) [Milligan]
- 10.1.18 SPI-3 Inquiry data in SPC-2 (99-130r1) [Penokie]
- 10.1.19 Extended Copy command in SPC-2 (99-143r0) [Snively]
- 10.1.20 Legacy & Persistent Reservations Interactions in SPC-2 (99-146r1) [Snively]
- 10.2 Recommendation that NCITS withdraw X3.276:1997 (SCC) [Penokie]
- 10.3 Recommendation that NCITS withdraw ANSI/ISO 9315:1989 [1994] Interfaces between flexible disk cartridges and their host controllers
- 10.4 Recommendation that NCITS reaffirm X3.131:1994, Small Computer System Interface - 2 (SCSI-2)
- 10.5 Making TTD and CIOP Obsolete (99-147r0) [Snively]
- 10.6 Add 4 reserved bytes to the L_Q Information Unit [Lamers]
- 11. ISO
 - 11.1 ISO Report [Milligan]
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- 12. Liaison Reports
 - 12.1 T11 Liaison Report [Cummings]
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 - 12.5 IEEE P1285 Status
 - 12.6 IEEE P1596.8 Status
 - 12.7 T11 FC Tape [Peterson/LaFollette/Oetting]
 - 12.8 SCSI Trade Association (STA) [Jones/Aloisi]
- 13. Review of Action Items
- 14. Meeting Schedule
 - 14.1 Authorization of Working Group Meetings
 - 14.2 Down Under [Allan]
 - 14.3 November 1999 and November 2000 Meeting Dates [Lamers]
- 15. Adjournment

Results of Meeting

1. Opening Remarks

John Lohmeyer, the T10 Chair, called the meeting to order at 9:00 a.m., Thursday March 11, 1999. He thanked John Hill and Beth Shutt of AMP for hosting the meeting.

John said that NCITS Subgroup Membership forms and the T10 Mailing Subscription form were available on the document table. He said that people should use the NCITS forms to insure the NCITS Secretariat has the latest membership information. These forms should be mailed directly to the NCITS Secretariat.

As is customary, the people attending introduced themselves and a copy of the attendance list was circulated. Copies of the draft agenda and general information on T10 were made available to those attending.

2. Approval of Agenda

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

- 9.2 Make Flag bit in CDB Control byte obsolete (98-241r1) [Snively]
- 10.1.1 Echo Mode for READ and WRITE BUFFER (98-184r6) [Lamers]
- 10.1.4 "May Not" Clarifications in SPI-3 (98-246r1) [Elliott]
- 10.1.5 Synchronous Transfer Timeout Function in SPC-2 (99-102r5) [Lamers]
- 10.1.6 Message Information Unit Definition in SPI-3 (99-104r1) [Penokie]
- 10.1.7 Clarification of SDTR/WDTR and PPR interaction in SPI-3 (99-108r3) [Lohmeyer]
- 10.1.8 Synchronous ATN Timing in SPI-3 (99-112r2) [Galloway]
- 10.1.9 DIFFSENS Timing in SPI-3 (99-113r2) [Galloway]
- 10.1.10 30 mV vs. 60 mV in figures 44 and 45 in SPI-3 (99-127r4) [Aloisi]
- 10.1.11 No zero length data in SPI-3 (99-132r0) [Galloway]
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- 10.1.15 Very Long CDBs in SPI-3 and FCP-2 (99-158r0) [Snively]
- 10.1.16 Very Long CDBs in SAM-2 and SPC-2 (98-188r2) [Houlder]
- 10.1.17 Version numbers in SPC-2 (99-110r1) [Milligan]
- 10.1.18 SPI-3 Inquiry data in SPC-2 (99-130r1) [Penokie]
- 10.1.19 Extended Copy command in SPC-2 (99-143r0) [Snively]
- 10.1.20 Legacy & Persistent Reservations Interactions in SPC-2 (99-146r1) [Snively]
- 10.3 Recommendation that NCITS withdraw ANSI/ISO 9315:1989 [1994] Interfaces between flexible disk cartridges and their host controllers
- 14.2 Down Under [Allan]
- 14.3 November 1999 and November 2000 Meeting Dates [Lamers]

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

- 10.5 Making TTD and CIOP Obsolete (99-147r0) [Snively]
- 10.6 Add 4 reserved bytes to the L_Q Information Unit [Lamers]

3. Attendance and Membership

The membership requirements were reviewed. NCITS rules permit one vote per organization. An individual from a new organization must attend two out of three consecutive plenary meetings. He/she may apply for voting membership the second meeting via a letter to the Chair of T10. The individual may vote at the second plenary meeting. Working group meetings do not count toward attendance requirements. For the purposes of letter ballot votes, a person attending their first meeting may become a voting member immediately following that meeting, provided their NCITS fees have been paid.

To maintain membership, organizations must pay the NCITS Service Fee (\$300). The ANSI International Program Fee (also \$300) is billed at the same time. The following organizations were terminated (deleted from the T10 membership list) for failure to pay the 1999 fees:

Dallas Semiconductor
Data General / Clariion

SyQuest Technology, Inc.

John briefly discussed the mailing fees. Complete pricing information is contained in the 1999 membership form (available at ftp://ftp.symbios.com/t10/pub/standards/io/t10/mem_form.txt).

The Chair said he had sent letters to 13 people from 6 organizations informing them that their membership was in jeopardy due to non-attendance (see 98-026r0) and that their membership would be terminated if they did not attend this meeting. The following organizations were in attendance jeopardy:

Circuit Assembly Corp.
Data General / Clarion
Hewlett Packard Co.
Honda Connectors
Philips Electronics
SyQuest Technology, Inc.

All of the organizations were present except:

Data General / Clarion
SyQuest Technology, Inc.

These organizations were already terminated for failure to pay the 1999 fees.

The following organization requested new (or reinstated) membership at this meeting:

BREA Technologies, Inc.
Panasonic Technologies, Inc

The T10 membership during the meeting was 47 organizations down from 48 organizations following the last meeting. Enclosure (1) is the list of the people present at the meeting and enclosure (2) is the current T10 membership list.

4. Approval of Minutes - November '98 Meeting Palm Springs, CA (T10/98-234r1)

The minutes were approved as written.

5. Document Distribution

Members who have any problems with their mailing subscription should deal directly with Judy Gales (jgales@itic.org) (202) 626-5741.

John Lohmeyer requested that all documents for the next mailing be in his hands in electronic format by 10:30 a.m. on Thursday March 18, 1999. Documents received after this time will go into a subsequent mailing.

John reminded the committee of the requirements for document submission. Since T10 meets its document retention requirements by preparing mailings, documents included in the mailing must be suitable for archiving. This means that native-format and/or Portable Document Format (PDF) electronic originals with proper identification must be submitted.

The electronic copies can be sent directly to John by e-mail (at lohmeyer@ix.netcom.com), or they can be transferred by ftp protocol to [ftp.symbios.com](ftp://ftp.symbios.com) and placed in the /pub/standards/io/incoming directory. In the latter case, please also send e-mail to John informing him of the file name and location of the file.

As usual, minutes are also available on the SCSI BBS (719-533-7950), the T10 World Wide Web page (see below), and will be distributed to the T10 Reflector.

To be added to the T10 Reflector, send an e-mail to majordomo@symbios.com with the line 'subscribe t10' in the message body. The NCITS Secretariat maintains a World Wide Web page at <http://www.ncits.org/>. LSI Logic maintains a World Wide Web page on behalf of T10 at <http://www.symbios.com/t10/>.

The current document register is enclosure (3). The T10 document register is also available on the SCSI BBS in file DR.TXT and at <ftp://ftp.symbios.com/pub/standards/io/t10/dr.txt>.

6. Call for Patents

This is a regular agenda item to identify any potential patent issues with developing standards. A call was made and no one identified any patents issues.

A document is available from ANSI, "Procedures for the Development and Coordination of American National Standards", at no charge. This document is also on the WWW at http://www.ncits.org/help/ansi_sdo.html. Section 1.2.11 contains the ANSI patent policy. Amy Marasco manages patent issues for ANSI and can be contacted at amarasco@ansi.org or 212-642-4954.

John Lohmeyer noted the receipt of a patent statement letter from Adaptec (99-138).

7. Review of Old Action Items

- 266) All project editors will return the project abstract forms regarding their project(s) to the Chair. *(Carry over)*
- 290) Bob Snively will notify the T10 reflector of his proposal to make the Flag bit obsolete. *(Complete)*
- 291) John Lohmeyer will notify NCITS that T10 has recommended that project 1224-DT (HAP) be terminated. *(Complete)*
- 292) John Lohmeyer will check the ANSI publication status of SES and SCC-2. *(Complete)*
- 293) Erich Oetting will notify the T10 reflector of the SSC working group proposal to make the Communications command set obsolete. *(Complete)*

John Lohmeyer noted that NCITS has stated a requirement that the project abstract information described in action item 266 be delivered prior to or with delivery of the project document for public review.

8. Project Status Reports

8.1 Project Status Summary and NCITS/OMC Liaison [Lohmeyer]

John Lohmeyer said that the current T10 project status summary was included in the T10 Information Packages and will be included in the mailing as usual.

8.2 SPI Amendment (SPIAmnd) {Project 0855-D} [Johansson/Lamers]

Larry Lamers reported that the amendment has been published. This item will be removed from future agendas.

8.3 SCSI Common Access Method - 3 (CAM-3) Status {Project 990-D} [Dallas]

John Lohmeyer took an action item to add an item to the May Plenary agenda to withdraw the CAM-3 project and to notify the project editor of this pending action.

8.4 SCSI-3 Stream Commands (SSC) Status {Project 997-D} [Peterson]

Erich Oetting reported on the activities of the SSC working group and the FC-Tape working group meetings. John Lohmeyer noted that equivalent information can be found in the liaison report from Dale LaFollette (99-159).

8.5 SCSI Parallel Interface - 2 (SPI-2) {Project 1142-D} [Ham/Penokie]

George Penokie reported that SPI-2 has been published. This item will be removed from future agendas.

8.6 SCSI Enhanced Parallel Interface (EPI) Technical Report {Project 1143-D} [Ham]

John Lohmeyer reported that EPI is at ANSI for publication.

8.7 SCSI Fibre Channel Protocol - 2 (FCP-2) {Project 1144-D} [Snively]

Bob Snively reported that FCP-2 revision 1 will be available for the committee mailing and will reflect the FC Tape updates. Bob discussed the listing of changes in FCP-2 that he is maintaining in a separate committee document. Concerns were raised regarding incorporation of changes in FCP-2 without T10 votes. Bob stated that FCP-2 is not stabilized (still in working draft form) and that T10 votes should not be necessary.

8.8 Serial Bus Protocol - 2 (SBP-2) {Project 1155-D} [Johansson]

John Lohmeyer reported that SBP-2 is at ANSI for publication (and may in fact be published, but he cannot confirm it).

8.9 SCSI Architecture Model - 2 (SAM-2) {Project 1157-D} [Weber]

Ralph Weber reported that, due to work overload, he has been unable to turn a SAM-2 revision since November. He noted that an additional person is being hired and that should allow more time to work on SAM-2 revisions. He described plans to make a SAM-2 revision after this meeting, to include the following: changes noted during the September meetings not related to multi-port issues, replacing most uses of 'SCSI-3' with 'SCSI', changing HiSupport to HiSup (standard Inquiry data bit name), and removing references to Search Data commands (which are obsolete in SBC). If approved at this meeting, the following documents will be incorporated in the next SAM-2 revision: 98-188r2 (Very Long CDBs) and 98-241r1 (Flag bit obsolete).

Ralph explained that a revision of SAM-2 containing the agreed multi-port changes would not be available until after the mailing cutoff date. He stated an intention to prepare a SAM-2 draft containing the agreed multi-port changes.

8.10 SCSI-3 Enclosure Commands (SES) {Project 1212-D} [Snively]

Bob Snively reported that SES is published. This item will be removed from future agendas.

8.11 High Availability Profile (HAP) Technical Report {Project 1224-DT} [open]

John Lohmeyer reported that NCITS voted to withdraw the project, per the T10 recommendation. This item will be removed from future agendas.

8.12 SCSI Controller Commands - 2 (SCC-2) {Project 1225-D} [Penokie]

George Penokie reported that SSC-2 has been published. This item will be dropped from future agendas.

8.13 Multimedia Command Set - 2 (MMC-2) Status {Project 1228-D} [Roberts]

Ron Roberts reported that 218 new comments were received on MMC-2 during the working group meeting. He noted that the MMC-2 working group meeting minutes can be found in 99-152. Ron described his future meeting plans and the information he reported was added to the T10 meeting schedule, as appropriate.

8.14 SCSI Primary Commands - 2 (SPC-2) Status {Project 1236-D} [Weber]

Ralph Weber reported that SPC-2 drafts are keeping up with T10 approved changes and stated an intention to produce a revision following this meeting to contain approved changes and the following: change the definition of 'reserved' to use the phrase "... are not required to check ...", incorporate SPI-3 definitions of "may" and "may not", add a protocol identifier field to 18h/19h mode pages with 0=FC, 1=Parallel, etc., and change communications device document references from SSC to SCSI-2 (if the proposal to make communications commands obsolete in SSC is approved).

8.15 Reduced Block Commands (RBC) {Project 1240-D} [McLean]

Pete McLean reported that the RBC working group met earlier in the week and developed letter ballot resolutions that satisfied all the people who submitted comments. The comments resolution document and an RBC draft incorporating the letter ballot comments resolution will be available for the next committee mailing. Pete reported that Ron Roberts will be taking over as project editor for RBC following the next committee mailing.

8.16 SCSI Socket/SSL Services Command Set (SSS) {Project 1246-D} [Parker]

John Lohmeyer took an action item to add an item to the May Plenary agenda to withdraw the SSS project and to notify the project editor of this pending action.

8.17 SCSI Parallel Interface - 3 (SPI-3) {Project 1302-D} [Penokie]

George Penokie reported SPI-3 revision 3 was prepared last week, including about 40 editor's notes that need resolution. He reported on the activities SPI-3 working group (minutes in 99-135). In response to a question from the committee, George announced that he will be seeking a stabilization vote for SPI-3 at the May meeting, and a letter ballot following the July meeting, with completion of the project work by the end of the year.

8.18 SCSI Enclosure Profile (SEP) Technical Report {Project 1303-DT} [Weber]

Ralph Weber moved that T10 recommend to NCITS that the SEP project (1303-DT) be withdrawn. Larry Lamers seconded the motion. Ralph stated that his motion was based on the lack of interest from any company in working on the project. The motion was approved 31:1:0:15=47. George Penokie stated that his negative vote was based on the belief that the technical report is needed. John Lohmeyer took an action item to notify NCITS of the T10 recommendation to withdraw project 1303-DT (SEP).

9. Old Business**9.1 Resolution of RBC Letter Ballot comments**

Pete McLean moved that 98-222r1 be accepted as resolving the RBC letter ballot comments and that RBC revision 8 be forwarded to NCITS for further processing towards first public review. Bob Snively seconded the motion.

George Penokie requested that the IBM negative vote on the RBC letter ballot be changed to Yes based on the satisfactory resolution of the letter ballot comments. Bob Snively requested that the Sun Microsystems negative vote on the RBC letter ballot be changed to Yes based on the satisfactory resolution of the letter ballot comments. Ed Gardner requested that the Ophidian Designs negative vote on the RBC letter ballot be changed to Yes based on the satisfactory resolution of the letter ballot comments. Ralph Weber requested that the LSI Logic negative vote on the RBC letter ballot be changed to Yes based on the satisfactory resolution of the letter ballot comments. Skip Jones requested that the Qlogic negative vote on the RBC letter ballot be changed to Yes based on the satisfactory resolution of the letter ballot comments.

Gene Milligan raised a point of order regarding the need for a roll-call vote for substantive changes to a dpANS. John Lohmeyer ruled a roll-call vote is not needed because RBC is not a dpANS until it is forwarded to NCITS.

The motion was approved 30:1:0:16=47. Mark Evans stated that his negative vote was based on the lack of time to review the final document, however he declined to invoke the two-week rule.

Mike Bryan took an action item to prepare RBC revision 8 for forwarding to NCITS. John Lohmeyer took an action item to forward RBC revision 8 to NCITS for further processing towards first public review.

9.2 Make Flag bit in CDB Control byte obsolete (98-241r1) [Snively]

Bob Snively moved that 98-241r1 be approved for inclusion in all documents described therein. Bill Galloway seconded the motion. The motion passed 27:0:1:19=47.

9.3 Making the Communications command set obsolete [Oetting]

Based on the recommendation of the SSC working group, Erich Oetting moved that the communications command set be made obsolete in SSC. Ken Hallam seconded the motion. Ralph Weber noted that SSC references in SPC-2 would be changed to SCSI-2. The motion passed 30:0:0:17=47.

10. New Business

10.1 Actions on Working Group Recommendations

10.1.1 Echo Mode for READ and WRITE BUFFER (98-184r6) [Lamers]

Based on the recommendation of the working group, Larry Lamers moved that 98-184r6 be approved for inclusion in SPC-2. Paul Aloisi seconded the motion. The motion passed 30:0:1:16=47.

10.1.2 Removing SCAM from SPI-3 (98-244r0) [Elliott]

Based on the recommendation of the January SPI-3 working group, Rob Elliott moved that SCAM be removed from SPI-3. Bill Galloway seconded the motion. Ed Gardner requested that SCAM be made obsolete and not just removed. Rob and Bill accepted this as a friendly amendment to the motion. The motion was amended to read, "that SCAM be made obsolete in SPI-3." The motion passed 29:0:0:18=47.

10.1.3 Clarification of MODIFY DATA POINTER message (99-109r0) [Lohmeyer]

Larry Lamers moved that 99-109r0 be approved for incorporation in SPI-3. John Lohmeyer seconded the motion. The motion passed 28:0:0:19=47.

10.1.4 "May Not" Clarifications in SPI-3 (98-246r1) [Elliott]

Rob Elliott moved that 98-246r1 be approved for inclusion in SPI-3. Bill Galloway seconded the motion. The motion passed 28:0:0:19=47.

10.1.5 Synchronous Transfer Timeout Function in SPI-3 (99-102r5) [Lamers]

Larry Lamers moved that 99-102r5 be approved for inclusion in SPI-3. Rob Elliott seconded the motion. The motion passed 28:0:0:19=47.

10.1.6 Message Information Unit Definition in SPI-3 (99-104r1) [Penokie]

George Penokie moved that 99-104r1 be approved for inclusion in SPI-3. John Lohmeyer seconded the motion. The motion passed 28:0:0:19=47.

10.1.7 Clarification of SDTR/WDTR and PPR interaction in SPI-3 (99-108r3) [Lohmeyer]

John Lohmeyer moved that 99-108r3 be approved for inclusion in SPI-3. Bill Galloway seconded the motion. The motion passed 28:0:0:19=47.

10.1.8 Synchronous ATN Timing in SPI-3 (99-112r2) [Galloway]

Bill Galloway moved that 99-112r1 be approved for inclusion in SPI-3. Larry Lamers seconded the motion. The motion passed 28:0:0:19=47.

10.1.9 DIFFSENS Timing in SPI-3 (99-113r2) [Galloway]

Bill Galloway moved that 99-113r2, 99-132r0, 99-133r0, and 99-134r1 be approved for inclusion in SPI-3. John Lohmeyer seconded the motion. It was noted that all the documents were unanimously recommended by the SPI-3 working group. The motion passed 24:0:2:21=47.

10.1.10 30 mV vs. 60 mV in figures 44 and 45 in SPI-3 (99-127r4) [Aloisi]

After reviewing the changes in revision 4, Paul Aloisi moved that 99-127r4 be approved for inclusion in SPI-3. Larry Lamers seconded the motion. The motion passed 24:1:0:22=47. Rob Elliott stated that his negative vote was based on the concerns raised in the working group.

10.1.11 No zero length data in SPI-3 (99-132r0) [Galloway]

See 10.1.9.

10.1.12 Timing for SCSI RST line in SPI-3 (99-133r0) [Galloway]

See 10.1.9.

10.1.13 PPR negotiation changes in SPI-3 (99-134r1) [Galloway]

See 10.1.9.

10.1.14 DT CRC Description in SPI-3 (99-157r1) [Leshay]

Based on the unanimous recommendation of the working group, Larry Lamers moved that 99-157r1 be approved for inclusion in SPI-3. Bill Galloway seconded the motion. The motion passed 25:0:1:21=47.

10.1.15 Very Long CDBs in SPI-3 and FCP-2 (99-158r0) [Snively]

Based on the unanimous recommendation of the working group, Bob Snively moved that 99-158r0 be approved for inclusion in SPI-3 and FCP-2. Paul Aloisi seconded the motion. The group reviewed details of the formats described in the proposal. It was noted that computed size values in the proposal were incorrect and correction of the problem was assigned to the affected document editors. The motion passed 25:1:2:19=47.

10.1.16 Very Long CDBs in SAM-2 and SPC-2 (98-188r2) [Houlder]

Bob Snively moved that 98-188r2 be approved for inclusion in SAM-2 and SPC-2. Gene Milligan seconded the motion. The motion passed 28:0:1:18=47.

10.1.17 Version numbers in SPC-2 (99-110r1) [Milligan]

Based on the unanimous recommendation of the working group, Gene Milligan moved that 99-110r1 be approved for inclusion in SPC-2. Larry Lamers seconded the motion. It was noted that the proposal uses byte 56 and that the project editor was instructed to move the version information to begin in byte 58. Gene agreed to revise the proposal for the web site. The motion passed 31:0:0:16=47.

10.1.18 SPI-3 Inquiry data in SPC-2 (99-130r1) [Penokie]

Larry Lamers moved that 99-130r1 be approved for inclusion in SPC-2. Bill Galloway seconded the motion. The motion passed 31:0:0:16=47.

10.1.19 Extended Copy command in SPC-2 (99-143r0) [Snively]

As the discussion on 99-143r0 extended to several minutes, Ralph Weber requested sufficient time to review the proposal (i.e., he invoked the two-week rule).

10.1.20 Legacy & Persistent Reservations Interactions in SPC-2 (99-146r1) [Snively]

Based on the unanimous recommendation of the working group, Bob Snively moved that 99-146r1 be approved for inclusion in SPC-2. Erich Oetting seconded the motion. The motion passed 30:0:0:17=47.

10.2 Recommendation that NCITS withdraw X3.276:1997 (SCC) [Penokie]

John Lohmeyer took an action item to notify the T10 Reflector that the committee intends to recommend the withdrawal the following standards at its May meeting:

- X3.276:1997 SCSI-3 Controller Commands
- X3.253:1995 SCSI-3 Parallel Interface
- X3.292:1997 SCSI-3 Interlocked Protocol
- X3.253/AM1:1998 SPI Amendment
- X3.277:1996 Fast-20

10.3 Recommendation that NCITS withdraw ANSI/ISO 9315:1989 [1994] Interfaces between flexible disk cartridges and their host controllers

John Lohmeyer moved that T10 request NCITS to reaffirm X3.131:1994, Small Computer System Interface - 2 (SCSI-2) and that NCITS withdraw ANSI/ISO 9315:1989 [1994] Interfaces between flexible disk cartridges and their host controllers and endorse the SC25 resolution to withdraw ISO/IEC 9315:1989. Bill Galloway seconded the motion.

On a roll-call vote the motion passed 35:0:0:12=47. The details of the roll-call vote are as follows:

Organization	S	Person	Yes	No	Abs	NP
Adaptec, Inc.	P	Mr. Lawrence J. Lamers	1			
AMP, Inc.	A	Mr. Charles Brill	1			
Amphenol Interconnect	P	Mr. Bill Mable	1			
Ancot Corp.						1
Apple Computer	A	Mr. Ron Roberts	1			
Berg Electronics	P	Mr. Douglas Wagner	1			
BREA Technologies, Inc.	P	Mr. Bill Galloway	1			
Circuit Assembly Corp.	A	Mr. Francesco Liburdi	1			
CMD Technology	P	Mr. Edward Haske	1			
Compaq Computer Corp.	P	Mr. Robert C. Elliott	1			
Distributed Processing Tech.						1
ENDL	P	Mr. I. Dal Allan	1			
Exabyte Corp.						1
Fujitsu (FCPA)	P	Mr. Ben-Koon Lin	1			
Harting, Inc. of N. America	P	Mr. Marcos Barrionuevo	1			
Hewlett Packard Co.	P	Mr. J. R. Sims	1			
Hitachi Cable Manchester	A	Ms. Jacqueline Sylvia	1			
Hitachi Storage Products	P	Mr. Anthony Yang	1			
Honda Connectors	P	Mr. Thomas J. Kulesza	1			
IBM Corp.	P	Mr. George Penokie	1			
Iomega Corp.	P	Mr. Tim Bradshaw	1			
KnowledgeTek, Inc.						1
Lasercard Systems Corp.	P	Mr. Hayden Smith	1			
Linfinity Micro						1
LSI Logic Corp.	P	Mr. John Lohmeyer	1			
Madison Cable Corp.	P	Ms. Jie Fan	1			
Maxtor Corp.	P	Mr. Pete McLean	1			
Methode Electronics, Inc.						1
Molex Inc.	A	Mr. Jay Neer	1			
Montrose/CDT						1
Mylex Corp.	P	Mr. Brian McKean	1			
Ophidian Designs	P	Mr. Edward A. Gardner	1			
Panasonic Technologies, Inc	P	Mr. Han Zou	1			
Philips Electronics	P	Mr. William P. McFerrin	1			
QLogic Corp.						1
Quantum Corp.	P	Mr. Mark Evans	1			
Seagate Technology	P	Mr. Gene Milligan	1			
Silicon Systems, Inc.	P	Mr. Robert Morris	1			
Sony Electronics, Inc.						1
Storage Technology Corp.	P	Mr. Erich Oetting	1			
Sun Microsystems Computer Co	P	Mr. Robert N. Snively	1			
The JPM Company						1
Toshiba America Elec. Comp.	P	Mr. Tasuka Kasebayahi	1			
UNISYS Corporation						1
Unitrode Corporation	P	Mr. Paul D. Aloisi	1			
Western Digital Corporation	P	Mr. Jeffrey L. Williams	1			
Woven Electronics						1
			35	0	0	12 = 47

John Lohmeyer took an action item to notify NCITS that T10 recommends the reaffirmation of X3.131:1994, Small Computer System Interface - 2 (SCSI-2). John Lohmeyer took an action item to notify NCITS that T10 recommends the withdrawal of ANSI/ISO 9315:1989 [1994] Interfaces between flexible disk cartridges and their host controllers.

10.4 Recommendation that NCITS reaffirm X3.131:1994, Small Computer System Interface - 2 (SCSI-2)

See 10.3.

10.5 Making TTD and CIOP Obsolete (99-147r0) [Snively]

Bob Snively reminded the committee that an action to make obsolete Target Transfer Disable and Continue I/O Process will be on the May agenda.

10.6 Add 4 reserved bytes to the L_Q Information Unit [Lamers]

Larry Lamers moved that the SPI-3 project editor be instructed to add 4 reserved bytes to the L_Q Information Unit. George Penokie seconded the motion. The motion passed 28:1:2:16=47. Ed Gardner stated that his negative vote was based on the belief that the issue should have had a working group recommendation.

11. ISO**11.1 ISO Report [Milligan]**

Gene Milligan presented an oral report to the committee and provided an electronic report contained in 99-164r0.

11.2 ISO Business [Milligan]

Ed Gardner moved that the IR be instructed to take the necessary steps to withdraw SPI and Fast-20 as international projects. Larry Lamers seconded the motion. The motion passed 33:0:0:14=47 by a roll call vote as follows:

Organization	S Person	Yes	No	Abs	NP
Adaptec, Inc.	P Mr. Lawrence J. Lamers	1			
AMP, Inc.	A Mr. Charles Brill	1			
Amphenol Interconnect	P Mr. Bill Mable	1			
Ancot Corp.					1
Apple Computer	A Mr. Ron Roberts	1			
Berg Electronics	P Mr. Douglas Wagner	1			
BREA Technologies, Inc.	P Mr. Bill Galloway	1			
Circuit Assembly Corp.	A Mr. Francesco Liburdi	1			
CMD Technology	P Mr. Edward Haske	1			
Compaq Computer Corp.	P Mr. Robert C. Elliott	1			
Distributed Processing Tech.					1
ENDL	P Mr. I. Dal Allan	1			
Exabyte Corp.					1
Fujitsu (FCPA)	P Mr. Ben-Koon Lin	1			
Harting, Inc. of N. America	P Mr. Marcos Barrionuevo	1			
Hewlett Packard Co.	P Mr. J. R. Sims	1			
Hitachi Cable Manchester	A Ms. Jacqueline Sylvia	1			
Hitachi Storage Products	P Mr. Anthony Yang	1			
Honda Connectors					1
IBM Corp.	P Mr. George Penokie	1			
Iomega Corp.	P Mr. Tim Bradshaw	1			
KnowledgeTek, Inc.					1
Lasercard Systems Corp.	P Mr. Hayden Smith	1			
Linfinity Micro					1
LSI Logic Corp.	P Mr. John Lohmeyer	1			
Madison Cable Corp.	P Ms. Jie Fan	1			
Maxtor Corp.	P Mr. Pete McLean	1			

Methode Electronics, Inc.		1
Molex Inc.		1
Montrose/CDT		1
Mylex Corp.	P Mr. Brian McKean	1
Ophidian Designs	P Mr. Edward A. Gardner	1
Panasonic Technologies, Inc	P Mr. Han Zou	1
Philips Electronics	P Mr. William P. McFerrin	1
QLogic Corp.		1
Quantum Corp.	P Mr. Mark Evans	1
Seagate Technology	P Mr. Gene Milligan	1
Silicon Systems, Inc.	P Mr. Robert Morris	1
Sony Electronics, Inc.		1
Storage Technology Corp.	P Mr. Erich Oetting	1
Sun Microsystems Computer Co	P Mr. Robert N. Snively	1
The JPM Company		1
Toshiba America Elec. Comp.	P Mr. Tasuka Kasebayahi	1
UNISYS Corporation		1
Unitrode Corporation	P Mr. Paul D. Aloisi	1
Western Digital Corporation	P Mr. Jeffrey L. Williams	1
Woven Electronics		1

33 0 0 14 = 47

Ron Roberts moved that the IR be instructed to take the necessary steps process MMC using the international fast track process. Rob Sims seconded the motion. The motion passed 31:2:0:14=47 by a roll call vote exactly the same as the above roll call vote except that Dal Allan (ENDL) and Ed Gardner (Ophidian Designs) changed their votes to No.

Larry Lamers moved that T10 not fast track SPC for international consideration. Ed Gardner seconded the motion. In the absence of any objections, the motion passed unanimously.

George Penokie moved that T10 not fast track SIP for international consideration. Larry Lamers seconded the motion. In the absence of any objections, the motion passed unanimously.

George Penokie moved that the IR be instructed to take the necessary steps process SBC using the international fast track process. Larry Lamers seconded the motion. The motion passed 31:2:0:14=47 by a roll call vote exactly the same as the above roll call vote except that Dal Allan (ENDL) and Ed Gardner (Ophidian Designs) changed their votes to No.

Hayden Smith moved that the IR be instructed to use 99-128r1 as the basis for an affirmative response to the ballot on CD 14776-381. Larry Lamers seconded the motion. The motion passed 32:1:0:14=47 by a roll call vote exactly the same as the above roll call vote except that Dal Allan (ENDL) changed his vote to No.

Gene Milligan took an action item to take the necessary steps to withdraw SPI and Fast-20 as international projects. Gene Milligan took an action item to take the necessary steps to process MMC using the international fast track process. Gene Milligan took an action item to take the necessary steps to process SBC using the international fast track process. Gene Milligan took an action item to use 99-128r1 as the basis for an affirmative response to the ballot on CD 14776-381.

12. Liaison Reports

12.1 T11 Liaison Report [Cummings]

No report.

12.2 T13 Liaison Report [Milligan]

In the interest of time, the committee asked Gene Milligan skip the oral report. Gene provided the following electronic report for the minutes:

T13 Liaison Report 3/11/99

The T13 Plenary Meeting #15 hosted by Ron Roberts of Sierra Pac on behalf of Apple in Placerville California February 23-26, 1999. NCITS 317-1998 ATA/ATAPI-4 and NCITS 316-1998-1394 to AT Attachment ñ Tailgate have been published.

The Ultra DMA 66 proposal for ATA/ATAPI-5 was reviewed with a few detailed changes agreed to.

Detailed proposals for Modification to the SMART Self-test Log Structure (D99105r0)(D99108R0) were reviewed and approved for inclusion in ATA/ATAPI-5.

Flush Cache was made mandatory in ATA/ATAPI-5.

The ATA/ATAPI-5 Draft was reviewed through the packet device state diagrams. An action item was assigned for all participants to determine if their products use the same checksum algorithm for Identify and SMART.

Tom Hanan, of Western Digital has converted the T13 web site to <http://www.T13.org>. The FTP site is still on fission.com. T13@T13.org is now the reflector address. For subscribing or unsubscribing address majordomo@T13.org.

The EDD v3.0 BIOS Technical project proposal was revised and the draft reviewed.

T13 decided to change the Method for Booting Reserved Area Boot Code (D98131r0) from a technical report to a standard.

A project proposal for Address Offset Feature (D98142R0) Technical Report was voted for forwarding.

A proposal for a Really Big LBA (D98142R0) for ATA/ATAPI-6 was reviewed. A straw poll favored 48 bits over 64 bits.

Hale Landis is developing a proposal for the additional host design data that is needed for a full host controller definition of Multiword DMA and make a proposal.

Pete McLean reported that the EPA has changed 8 seconds from standby to active to be a recommendation rather than required.

Quantum is working on a response to the call for patents concerning ATA/ATAPI-5. The contact person is Steve Wilkins 408-894-5235 or steve.wilkins@quantum.com for information regarding licensing.

Circuit Assembly sent a letter (to be assigned a number) offering to license their patents concerning the 80 line cable. At the moment the license is only available to SFF and T13 member companies.

The next meeting of T13 is April 27-30, 1999 hosted by Seagate in the Raintree Hotel, Longmont, Colorado.

12.3 SFF Industry Group [Allan]

In the interest of time, the committee asked Dal Allan skip delivering an oral report. Dal provided the following electronic report for the minutes.

SFF Committee Report

The HSS (High Speed Serial) Testing SSWG (Specific Subject Working Group) met in Cupertino and Little Rock and continued making good progress. The next HSS SSWG is scheduled for St. Augustine March 30-31. The current project is based on duplex copper connector cables, and two new projects will begin, one on backplanes and the other for duplex optical cables.

SFF-8441 for VHDCI (Very High Density Cable Interconnects) and SFF-8451 for SCA-2 (Single Connector Attach) have been approved for publication.

The issues on SFF-8420 for HSSDC (High Speed Serial Data Connector) have been addressed but are not resolved. Carl Fiske set a deadline for input to the IEC draft on HSSDC because he is in jeopardy of losing his role as editor for failing to provide input to the IEC.

During implementation of the extensions to SFF-8067 some changes were identified, and will be included in the next revision.

INF-8090i has been submitted for balloting to be re-issued. The members voted to Expire 8090i on the premise that it was the same as MMC-2 but there is a 200-page difference in size. Pioneer explained that 8090i has many of the features of both a profile and an implementation guide in order to ensure plug-compatibility between vendors. 8090i represents a specification of what industry will be shipping to the 80x86 marketplace. Mt Fuji meetings (8090) will be held during T10 week and in Japan on even months.

As requested by the members, a new draft of INF-8070i has been provided.

SFF-8012 for 4-pin power has been approved for publication and the changes incorporated will be forwarded for the next revision of the EIA standard and submittal to IEC.

The GBIC has moved from an 'i' specification to project status and the first SSWG will be held in April during T11 week.

A request has been made for a 68-pin version of SCA-2 for Fibre Channel tape drives. There is not enough 5V power in 8045 and about 10 pins are needed to provide for a library connection. The new project will be SFF-8072, and a companion specification to define a common location for the connector will be SFF-8572.

12.4 IEEE 1394 [Johansson]

No report.

12.5 IEEE P1285 Status

No report.

12.6 IEEE P1596.8 Status

No report.

12.7 T11 FC Tape [Peterson/LaFollette/Oetting]

Please see 99-159. This topic will be covered under the SSC report for future meetings.

12.8 SCSI Trade Association (STA) [Jones/Aloisi]

Paul Aloisi made an oral report to the committee. The following information was excerpted from Paul's slides.

November STA Meetings

Technical: 16 people attended in Palm Springs, CA. Mark Delsman presented the SCSI roadmap and took comments from the T10 members. Benjie Sun reviewed Version 4 of the SCSI Harbor document. Human Factors issues were noted and discussed.

Committee: New members; Andataco, EuroLogic, and IMP. Departing members; Ancot, Xyratex, and Tempex. Still 23 members. Jay Neer was appointed to the board of the directors to fill a vacancy. Three domain validation levels were defined. Reviewed SCSI Roadmap and SCSI Terms, with both documents being edited for a January vote.

January STA Meetings

Technical: 21 people attended, in Seaside, CA, representing a good mix of server and disk companies. Revision 5 of the SCSI Harbor document was reviewed. A new wrapper and dock were shown. The dock is now set up for 1- or 1.6-inch drives. The Intel human factors group and design groups are working with us. The meeting noted a need to start system testing.

Annual Meeting: The STA Roadmap was approved now is available on the web site. The STA - SCSI Terms were approved and now are available on the web site. It was reported that the web site hits are on the rise 100/day last April, now 200+/day in January. Ask the SCSI expert is receiving about 8 questions per day. The STA budget was approved. STA is writing CTR articles, and supporting the "Ask SCSI Expert" column.

A new Board of Directors was elected as follows:

- Harry Mason Chairman LSI Logic
- Skip Jones Vice Chairman Qlogic
- Jon Baker Treasurer Seagate
- Mark Delsman Secretary Adaptec
- directors Jay Neer Molex, Pat McGarrah Quantum, Paul Aloisi Unitrode, Kon Leong GigaLabs, Charles Tashbook Dallas Semi, and Ariadne Horstman IBM.

13. Review of Action Items

- 266) All project editors will return the project abstract forms regarding their project(s) to the Chair.
- 294) John Lohmeyer will add an item to the May Plenary agenda to withdraw the CAM-3 project and to notify the project editor of this pending action.
- 295) John Lohmeyer will add an item to the May Plenary agenda to withdraw the SSS project and to notify the project editor of this pending action.
- 296) John Lohmeyer will notify NCITS of the T10 recommendation to withdraw project 1303-DT (SEP).
- 297) Mike Bryan will prepare RBC revision 8 for forwarding to NCITS.
- 298) John Lohmeyer will forward RBC revision 8 to NCITS for further processing towards first public review.
- 299) John Lohmeyer will notify NCITS that T10 recommends the reaffirmation of X3.131:1994, Small Computer System Interface - 2 (SCSI-2).
- 300) John Lohmeyer will notify NCITS that T10 recommends the withdrawal of ANSI/ISO 9315:1989 [1994] Interfaces between flexible disk cartridges and their host controllers.
- 301) John Lohmeyer will notify the T10 Reflector that the committee intends to recommend the withdrawal the following standards at its May meeting: X3.276:1997 SCSI-3 Controller Commands, X3.253:1995 SCSI-3 Parallel Interface, X3.292:1997 SCSI-3 Interlocked Protocol, X3.253/AM1:1998 SPI Amendment, and X3.277:1996 Fast-20.
- 302) Gene Milligan will take the necessary steps to withdraw SPI and Fast-20 as international projects.
- 303) Gene Milligan will take the necessary steps to process MMC using the international fast track process.
- 304) Gene Milligan will take the necessary steps to process SBC using the international fast track process.

Other T10-authorized meetings:

Meeting	Date		Location / Contact
T10/T11.3	4/13/99	Tue	Palm Springs, CA / T11
Joint Tape WG			
Cable Perf.	4/6/99	Tue	Manchester, NH / Zane Daggett
SPI-3 WG	4/7-8/99	Wed-Thu	Monterey, CA / Larry Lamers

Meeting Map Abbreviation Key:

Amnd: Amendment
 CAM: Common Access Method
 CAM-3: Next generation CAM for SCSI-3
 EPI: SCSI Enhanced Parallel Interface (Technical Report)
 Encl Profile Enclosure Profile Study Group
 Fast-20: Data Transfer at 20 Mega-transfers/second (a.k.a., Ultra)
 Fast-40: Data Transfer at 40 Mega-transfers/second (a.k.a., Ultra2)
 Fast-80: Data Transfer at 80 Mega-transfers/second (a.k.a., Ultra3)
 FC: Fibre Channel
 FC-AL: Fibre Channel - Arbitrated Loop (a T11 project)
 FCLC: Fibre Channel Loop Community (not an NCITS activity)
 I/F: Interface
 HAP: High Availability Profile (Technical Report)
 LB: Letter Ballot
 MMC-2: Multimedia Commands - 2 (CD-ROM, DVD, etc.)
 PH: Physical (Connectors, Cables, Transceivers, etc.)
 Plenary: Full Committee Meeting
 RAID: Redundant Array of Independent Devices
 RBC: Reduced Block Commands
 SBC: SCSI-3 Block Commands
 SBP-2: Serial Bus Protocol for IEEE 1394 (2nd generation protocol)
 SCC-2: SCSI Controller Commands - 2 (2nd generation RAID command set)
 SCSI: Small Computer System Interface
 SES: SCSI Enclosure Services
 SCSI Harbor: A STA project on defining a wrapper for SCSI devices
 SFF: SFF Industry Group (not an NCITS activity)
 SG: Study Group
 SMC: SCSI-3 Medium Changer Commands
 SPC-2: SCSI Primary Commands - 2 (2nd generation)
 SPI-2: Second Generation SCSI Parallel Interface
 SPI-3: Third Generation SCSI Parallel Interface
 SSA: Serial Storage Interface
 SSC: SCSI-3 Stream Commands (includes Tape)
 SSWGs: Specific-Subject Working Groups
 STA: SCSI Trade Association (not an NCITS activity)
 STA Tech: STA Technical Meeting (T10 members invited)
 T10: Lower Level Interfaces Technical Committee
 WG: Working Group (same as Ad Hoc Group)

For more information about T10 activities, please contact the following people:

Activity	Contact	Telephone/Email
CAM-3	Bill Dallas	(603) 881-2508 dallas@zk3.dec.com

EPI	Bill Ham	(508) 841-2629 bill.ham@digital.com
FCP, FCP-2, SES	Robert Snively	(415) 336-5332 Bob.Snively@eng.sun.com
GPP	Gary Stephens	(602) 321-1725 grsfsi@aol.com
SBC	Gene Milligan	(405) 324-3070 gene_milligan@notes.seagate.com
MMC, MMC-2	Ron Roberts	(916) 677-5714 rkroberts@aol.com
SBP-2 or RBC	Pete McLean	(303) 678-2149 pete_mclean@maxtor.com
SBP-2	Peter Johansson	(510) 527-3926 pjohansson@aol.com
SCC-2, SPI-2, SPI-3	George Penokie	(507) 253-5208 gop@us.ibm.com
SMC	Erich Oetting	(303) 673-2178 Erich_Oetting@Stortek.com
SPC, SPC-2, SAM-2, SEP	Ralph Weber	(972) 503-3205 x228 roweber@acm.org
SSA-PH1, -PH2, -TL1, -TL2	Larry Lamers	(408) 957-7817 ljlammers@ix.netcom.com
SSA-S2P & -S3P	John Scheible	(512) 823-8208 Scheible@vnet.ibm.com
SSC	Dave Peterson	(612) 391-1008 dap@network.com
SSS	Keith Parker	(503) 255-1035 diogenes@europa.com
Other Activities	John Lohmeyer	(719) 533-7560 lohmeier@ix.netcom.com

The long-term T10 meeting week schedule is:

Date	Location	Host/Comments
May 3-7, 1999	Manchester, NH	Hitachi Cable
Jul 12-16, 1999	Colorado Springs, CO	LSI Logic
Sep 13-17, 1999	Huntington Beach, CA	QLogic
Nov 1-5, 1999	Monterey, CA	Adaptec / dates changed
Jan 10-14, 2000	Brisbane, Australia	ENDL Pacific Technologies
Mar 6-10, 2000	Dallas, TX	Unitrode
May 8-12, 2000	Manchester, NH	Hitachi Cable
Jul 10-14, 2000	Colorado Springs, CO	LSI Logic
Sep 11-15, 2000	Huntington Beach, CA	QLogic
Oct 30-Nov 3, 2000	Monterey, CA	Adaptec / dates changed

John Lohmeyer presented the revised meeting date and location schedule shown above. Erich Oetting moved that T10 approve the revisions in the meeting schedule. Paul Aloisi seconded the motion. The motion passed 21:1:0:25=47.

14.1 Authorization of Working Group Meetings

John noted that the working group meetings are required to operate under the same voting procedures as does T10 (that is, one vote per organization) and the results of a working group are not binding on the parent committee. Ad hoc groups should strive to achieve consensus prior to bringing issues to T10.

Mark Evans moved that T10 authorize the T10-related meetings and events in the list above. Jay Neer seconded the motion. The motion passed unanimously.

14.2 Down Under [Allan]

Dal reported on the status of a tour he described in a message to the T10 Reflector.

14.3 November 1999 and November 2000 Meeting Dates [Lamers]

See 14.0.

15. Adjournment

The meeting was adjourned at 12:50 p.m. on Thursday March 11, 1999.

Meeting Attendees -- Enclosure (1)

Name	S	Organization	Electronic Mail Address
Mr. Lawrence J. Lamers	P	Adaptec, Inc.	ljlamers@ieee.org
Mr. Mark Delsman	A	Adaptec, Inc.	mdelsman@corp.adaptec.com
Mr. Charles Brill	A	AMP, Inc.	cebrill@amp.com
Mr. Elwood Parsons	V	AMP, Inc.	etparson@amp.com
Mr. Bill Mable	P	Amphenol Interconnect	bmable@spectra.net
Mr. Ron Roberts	A	Apple Computer	rkroberts@aol.com
Mr. Douglas Wagner	P	Berg Electronics	wagnerdl@bergelect.com
Mr. Bill Galloway	P	BREA Technologies, Inc.	billg@breatech.com
Mr. Francesco Liburdi	V	Circuit Assembly Corp.	fliburdi@circuitassembly.com
Mr. Edward Haske	P	CMD Technology	haske@cmd.com
Mr. Robert C. Elliott	P	Compaq Computer Corp.	Robert.Elliott@compaq.com
Mr. Neil Wanamaker	O	Crossroads Systems, Inc.	ntw@crossroads.com
Mr. I. Dal Allan	P	ENDL	endlcom@ibm.net
Mr. Ben-Koon Lin	P	Fujitsu (FCPA)	blin@fcpa.fujitsu.com
Mr. Nathan Hastad	O	General Dynamics	nathan.j.hastad@gd-is.com
Mr. Marcos Barrionuevo	P	Harting, Inc. of N. America	Marcos.Barrionuevo@harting.com
Mr. J. R. Sims	P	Hewlett Packard Co.	robsims@hootie.lvld.hp.com
Ms. Jacqueline Sylvia	A	Hitachi Cable Manchester	jsylvia@hcm.hitachi.com
Mr. Anthony Yang	P	Hitachi Storage Products	anthony.yang@hal.hitachi.com
Mr. Thomas J. Kulesza	P	Honda Connectors	tkulesza@hondaconnectors.com
Mr. George Penokie	P	IBM Corp.	gop@us.ibm.com
Mr. Tim Bradshaw	P	Iomega Corp.	bradshat@iomega.com
Mr. Hayden Smith	P	LaserCard Systems Corp.	hsmith@lasercard.com
Mr. John Lohmeyer	P	LSI Logic Corp.	lohmeyer@ix.netcom.com
Mr. Ralph O. Weber	A	LSI Logic Corp.	roweber@acm.org
Ms. Jie Fan	P	Madison Cable Corp.	jfan@madisoncable.com
Mr. Pete McLean	P	Maxtor Corp.	pete_mclean@maxtor.com
Mr. Charley Riegger	A	Maxtor Corp.	charles_riegger@maxtor.com
Mr. Jay Neer	A	Molex Inc.	jneer@molex.com
Mr. Brian McKean	P	Mylex Corp.	brianm@mylexboulder.com
Mr. Edward A. Gardner	P	Ophidian Designs	eag@ophidian.com
Mr. Han Zou	P	Panasonic Technologies, Inc	hanzou@research.panasonic.com
Mr. William P. McFerrin	P	Philips Electronics	BMcFerrin@aol.com
Mr. Skip Jones	P	QLogic Corp.	sk_jones@qlc.com
Mr. Mark Evans	P	Quantum Corp.	mark.evans@quantum.com
Mr. Gene Milligan	P	Seagate Technology	Gene_Milligan@notes.seagate.com
Mr. Robert Morris	P	Silicon Systems, Inc.	bob.morris@ti.com
Mr. Erich Oetting	P	Storage Technology Corp.	erich_oetting@stortek.com
Mr. Robert N. Snively	P	Sun Microsystems Computer Co	bob.snively@sun.com
Mr. Tasuka Kasebayashi	P	Toshiba America Elec. Comp.	task.kasebayashi@taec.toshiba.com
Mr. Kenneth J. Hallam	P	UNISYS Corporation	ken.hallam@unisys.com
Mr. Paul D. Aloisi	P	Unitrode Corporation	aloisi@unitrode.com
Mr. Donald R. Getty	A	Unitrode Corporation	gettd@unitrode.com

43 People Present

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

T10 Attendance Database on 1999/03/17 at 12:52:10 -- Enclosure (2)

Mr. Lawrence J. Lamers (P) Phone: (408) 957-7817
Adaptec, Inc. Fax: (408) 957-7193
691 S. Milpitas Blvd. Email: ljlamers@ieee.org
Milpitas, CA 95035

Mr. Vincent Bastiani (A#) Phone: (408) 957-7153
Adaptec, Inc. Fax:
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Milpitas, CA 95035

Mr. Wally Bridgewater (A#) Phone: (408) 945-8600
Adaptec, Inc. Fax:
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Milpitas, CA 95035

Mr. Mark Delsman (A) Phone: (408) 957-5661
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Milpitas, CA 95035

Mr. Martin L. Sodos (O) Phone: (408) 383-5734
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1150 Ringwood Ct. Email: msodos@advansys.com
San Jose, CA 95131

Mr. Steven P. Ego (O) Phone: (512) 258-2303
Aeronics Inc. Fax: (512) 258-4392
12741 Research Blvd #500 Email:
Austin, TX 78759

Mr. Kent Manabe (O) Phone: (408) 441-9232
America Kotobuki Electronics Fax: (408) 441-9246
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Mr. Scott Lindstrom (P) Phone: (704) 824-6352
AMP, Inc. Fax: (704) 824-6268
603 Groves Street Email: slindstr@amp.com
Lowell, NC 28098

Mr. Charles Brill (A) Phone: (717) 810-4642
AMP, Inc. Fax: (717) 533-1279
112 Harvey Rd. Email: cebrill@amp.com
Hershey, PA 17033

Ms. Bonnie Rose (O) Phone: (416) 291-4401 x2239
Amphenol Canada Corp. Fax: (416) 292-0647
20 Melford Dr. Email: brose@cosmosgroup.com

Scarborough, Ontario
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Mr. Bill Mable (P)
Amphenol Interconnect
20 Valley St.
Endicott, NY 13760

Phone: (607) 786-4236
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