

Accredited Standards Committee*
X3, Information Processing Systems

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Project:

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Reply to: John Lohmeyer

To: Membership of X3T10

From: Ralph Weber, Acting Secretary X3T10
John B. Lohmeyer, Acting Chair X3T10

Subject: Minutes of X3T10 Plenary Meeting #2
Newport Beach, CA -- March 17 - 18, 1994

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X3 Secretariat, Computer and Business Equipment Manufacturers Association (CBEMA)

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Results of Meeting

1. Opening Remarks

John Lohmeyer, the Acting Chair, called the meeting to order at 1:00 p.m., Thursday March 17, 1994. He thanked Skip Jones of QLogic Corp. for arranging and hosting the meeting. John said that he had copies of the call for volunteers to Chair X3T10 for anyone who wishes to apply.

Gary Stephens announced that Bill Spence has suffered another coronary event. Gary distributed get well cards so that committee members could express their sympathies. Dal will insure that the cards get delivered to Bill.

John said that X3 Subgroup Membership forms and X3T10 Mailing Subscription form were available on the document table. He said that people should use the X3 forms to insure the X3 Secretariat has the latest membership information. The X3 Membership forms and the X3T10 Mailing Subscription forms should be mailed to the X3 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 X3T10 were made available to those attending.

2. Approval of Agenda

The draft agenda was approved with the following additions:

14.3 Notification of Meeting Hosts Regarding Schedule Changes

3. Attendance and Membership

The membership requirements were reviewed. X3 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 X3T10. The individual may vote at the second plenary meeting. Working group meetings do not count toward attendance requirements.

Organizations must also pay the X3 Service Fee (\$300) to maintain membership. This year, the International Participation fee (\$300) will be billed separately directly from ANSI. Payments must be received by April 8, 1994 or the membership will be dropped and the organization will not be permitted to vote or receive mailings.

The X3T10 membership is now at 60 organizations, with no changes since the first meeting. Enclosure (1) is the list of the people present at the meeting and enclosure (2) is the current X3T10 membership list.

John distributed a CBEMA list of the committee membership. John recommended filling out an address correction form (on the documents table) if the information on the CBEMA list is incorrect.

4. Approval of Minutes - January Meeting San Diego, CA (X3T10/94-016r1)

The minutes were approved as written.

5. Document Distribution

Members who have any problems with their mailing subscription should deal directly with Katrina Gray at (202) 626-5741.

Larry Lamers requested that all documents for the next mailing must be sent so as to be received by noon on Friday, March 31, 1994. Documents received after this date will go into a subsequent mailing.

Larry Lamers reminded the committee of the requirements for document submission to be included in the committee mailing. Since X3T10 meets its document archiving requirements by including the X3 Secretariat on the mailing list, documents included in the mailing must be suitable for microfilming. This means that high-quality, single-sided originals with adequate margins and proper identification must be submitted. Document X3T9.2/92-84 R1 contains the list of requirements for submissions.

As usual, minutes are also available on the SCSI BBS (719-574-0424) and will be distributed to the SCSI Reflector E-mail list. To be added to the SCSI Reflector, send an electronic message to: scsiadm@WichitaKS.NCR.COM.

The current document register is enclosure (3).

6. Call for Patents

This is a regular agenda item to identify any potential patent issues with developing standards.

A document is available from ANSI, "Procedures for the Development and Coordination of American National Standards", at no charge. The last page contains the ANSI patent policy.

7. Review of Old Action Items

- 1) John Lohmeyer will contact AIIM regarding AIIM activities. **Complete.** John contacted Judy Kilpatrick and discovered that Ken Hallam is coordinating this work. Ken has agreed to act as liaison.
- 2) John Lohmeyer will contact Fernando Podia regarding liaison reports. **Complete.**
- 3) Larry Lamers will incorporate the correct patent statement in the dpANS AT Attachment and will send a copy to the X3 Secretariat. **Complete.**
- 4) On behalf of X3T10, John Lohmeyer will submit a public review comment against SPI requesting that SCAM be incorporated. **Complete.**
- 5) John Lohmeyer to progress the SCC project proposal to X3. **Complete.**
- 6) John Lohmeyer to progress the MMC project proposal to X3. **Complete.**
- 7) John Lohmeyer to discuss combined TC/TG mailing with X3 Secretariat. **Complete** -- They are willing to do combined mailings.
- 8) Gene Milligan to revise project proposal on GPP. **Complete.**
- 9) John Lohmeyer to contact the X3 Secretariat regarding electronic SDs. **Complete** -- The SD-2 and SD-3 are posted on the SCSI BBS.

8. Subgroup and/or Project Status Reports

8.1 Project Status Summary [Lohmeyer]

John Lohmeyer presented the current X3T10 project status summary. He noted no major changes from previous reports. Details of project status for each project will be presented below.

8.2 X3T10.1 Task Group Report [Scheible]

Substituting for John Scheible, Ken Hallam reported on meetings to define the documentation for transceivers and connectors. The meetings chose to document connectors in sufficient detail for successful interoperable implementations. For transceivers, the group decided to inspect existing transceivers specifications. Several key aspects of the inspected specifications were chosen for inclusion in the standard. Bill Ham noted that shield requirements also would be a critical part of the specification.

In the X3T10.1 meeting, John Scheible promised to get an IBM patent statement by the May meeting. John also will have a word-format version of the SSA-PH document by May. The meeting voted unanimously to request identifier codes from PCI. The meeting considered a new internal cable.

X3T10.1 is calling for volunteers to chair the committee. There have been some problems getting volunteers. However, Ken felt that this is no longer a problem.

8.3 SCSI-2 Status [Lamers]

John Lohmeyer reported that SCSI-2 was approved by the ANSI Board of Standards Review on January 31, 1994. It will be designated X3.131-1994. Publication is expected soon.

Larry sent a copy to Bob Hager for ANSI publication.

Dal Allan noted that 4796 copies of SCSI-2 have been sold by Global Engineering.

8.4 SCSI Common Access Method (CAM) [Dallas]

Bill Dallas reported on the CAM editing session this past Monday. See 94-073 for details.

8.5 AT Attachment Status (ATA) [Lamers]

AT Attachment is out for letter ballot at X3. The letter ballot closes on March 30, 1994.

8.6 ATA Extensions (ATA-2) [Finch]

Steve Finch reported that the last meeting of the ATA Working Group was held Monday, March 14. A total of 22 persons were in attendance. Issues discussed included: 16.6 MB/s transfer rates, electrical signal definitions, and issues relating to improving the ATA-2 document in the areas including but not limited to: ATA DMA issues, power management issues, and Master/Slave hardware issues.

Also discussed were the ATA-3 Project Proposals. The working group expressed reservations that their approval might impact ATA-2. After some discussion, it was unanimously agreed that the project proposals should be approved so that parallel development of advanced features could begin.

8.7 SCSI-3 Architecture Model (SAM) Status [Monia]

Charles Monia described a working group review of SAM revision 12a. The review primarily was to inform members of changes in SAM. Charles noted that he will be revising the document for distribution in the next mailing.

Gene Milligan moved that all options in all protocol standards produced by X3T10 be changed to mandatory. Ed Gardner seconded the motion.

Gary Stephens noted that allowing options in protocol standards creates a scenario where the entities at both ends of the wire (the protocol) are capable to transact an operation but the wire will not transmit the description of the operation. This problem arose from a working group debate regarding options in FCP. About half a dozen persons spoke against the motion. A motion to end debate passed 41 to 1.

The motion was defeated, 1 to 33.

8.8 SCSI-3 Parallel Interface (SPI) Status [Lamers]

John reported that public review closed on February 25, 1994. One comment was received, from X3T10. The comment asked that SCAM be added to the standard.

8.9 SCSI-3 Interlocked Protocol (SIP) Status [Lamers]

No status change. John reported that efforts have been made to find help for editing SIP.

8.10 SCSI-3 Generic Packetized Protocol (GPP) Status [Stephens]

At the last meeting, X3T10 voted to re-direct this project to be a Technical Report instead of a standard. John noted that a motion to reconsider was expected under agenda item 9.2.

8.11 SCSI-3 Serial Bus Protocol (SBP) Status [Marazas]

Gerry Marazas reported that numerous written comments were received on a letter ballot for forwarding SBP. A meeting was held earlier this week to review and resolve the letter ballot comments. There will be a new SBP revision (16) based on the letter ballot comments and their resolution. Revision 16 will be available for the next mailing.

John warned the membership to expect a forwarding letter ballot for SBP. This was followed by a lengthy discussion of the general policies for forwarding documents and the specific actions this case.

In summary, there will be a letter ballot for SBP forwarding to X3 sent to principle representatives. A copy of the SBP document to forward will be in the mailing. A copy of the comments and responses also will appear in the next mailing.

8.12 SCSI-3 Fiber Channel Protocol (FCP) Status [Snively]

John reported that the FCP letter ballot passed 47:2:0 (11 ballots not returned). There were two yes with comments ballots.

Bob Snively reported on the working group activities to resolve no votes on the FCP letter ballot. Bob promised to provide a complete comments resolution document. Bob reported that some major technical issues have not been resolved. Bob described the actions that he will take from this point forward. Those actions include directly mailing a revised FCP to committee members prior to two-weeks before the next plenary meeting.

Bob described the resolution of the following major technical issues.

PRLI/PRLO -- PRLI is optional. PRLI acts only on an image pair.

Class 3 interlock -- Class 3 requires an interlocking protocol definition in FCP. Class 3 is desirable in some situations. Bob is not sure whether the interlock definition will be added or Class 3 will be prohibited in FCP.

FQXID -- Must be extended for process associators and XID invalidation.

LUN 0 -- Bob requested that SAM define the ability to retrieve collective device capability information at LUN 0. This produced short discussion with no resolution.

Data Count -- There is a general lack of agreement between SBP, SSP, and FCP regarding data length information within the protocol. There is no resolution yet.

Fiber Channel Nports -- There is a limit on resources in ports that can block delivery of a task management function. A warning about this problem will be added.

8.13 SCSI-3 Primary Commands (SPC) Status [Weber]

Generation of the first draft of SPC has progressed as far as the INQUIRY command.

8.14 SCSI-3 Block Commands (SBC) [open]

John reported that there still is no project editor. Hopes were high regarding the gentleman from Samsung. However, since the gentleman was absent from the meeting, hopes were deflating quickly.

8.15 SCSI-3 Stream Commands (SSC) [Lappin]

Ed Lappin reported that a SSC document has been drafted for the next mailing. There were questions about the correct home for the processor commands. Ralph noted that the January meeting expressed a preference for putting the processor commands in the SPC.

8.16 SCSI-3 Graphics Commands (SGC) [open]

A project editor is being sought. John noted that, if no editor can be found in X3T10, he would be interested in a coordinated effort with AIIM and possibly IT8.

8.17 SCSI-3 Medium Changer Commands (SMC) [open]

A project editor is being sought. There is an old draft from Gary Stephens is available. Questions were raised regarding the relationship of medium changer commands in SPC and the SMC document. That relationship is defined in X3T9.2/92-006R1 (an approved committee document).

8.18 Directly-Addressable Device Interface (DADI) []

No formal report. Jim McGrath noted a possible interaction with ongoing PCMCIA work.

8.19 SCSI Common Access Method -2 (CAM-2) (93-082) [Dallas]

Bill Dallas reported that no work will be undertaken until CAM (classic) is ready for second public review.

8.20 SCSI-3 Serial Storage Protocol (SSP) [Scheible]

Ken Hallam reported that the SSP group met. All activities of the group are recommendations. The project proposal has not been approved yet. The group is recommending that autosense be a mandatory part of the SSP standard. Ken noted that SSP autosense data would be transferred before status is transferred.

John Lohmeyer stated that the SSP project proposal will go to OMC next week.

Steve Finch moved that upon approval the SSP project be assigned to the X3T10.1. Ed Gardner seconded the motion. Multiple tens of minutes were devoted to discussing how best to schedule protocol/physical issues meetings. John noted that the concern that originally put SSP in X3T10 was the structural separation of X3T9.7 and X3T9.2. That is no longer a problem. The work of X3T10.1 will be forwarded to X3T10.

The motion passed 10 to 6. (John noted that apathy won 25 to 16.)

8.21 SCSI-3 Controller Commands (SCC) (93-130) [Penokie]

John reported that the SCC project proposal will be on the OMC agenda next week.

8.22 Multimedia Command Set (MMC) [Harris]

Norm Harris distributed a revision 0 of the document at the working group meeting. The document includes the CD-ROM command set. Norm is looking for input regarding additional commands, particularly disk commands for multi-media.

Concerns were raised regarding the cover page currently in use. John promised to work with Norm to make the cover page reflect the absence of an approved project proposal.

8.23 Replacement of ANSI X3.80-1988, Interfaces Between Flexible Disk Cartridges and Their Host Controllers, with ISO 9315:1989.

In April '93, X3T9.2 voted to recommend that simultaneous withdrawal of X3.80-1988 and adoption of ISO 9315:1989 as an ANSI standard. X3T9 accepted this recommendation and voted to make the same recommendation to X3. The public review period closed February 13, 1994. No comments were received. The recommendation is now at X3 letter ballot, which closes April 20, 1994.

8.24 RAID Study Group [Penokie]

George Penokie reported on the two RAB meetings since the last plenary. George was pleased to report that the new component logical unit (C-LUI) concept goes a long way towards solving the dual-controller issues identified in February. George will be building a new revision of the SCSI Disk Array Model (94-040r3) for inclusion in the next mailing. The new revision will include new C-LUI Services; Attach C-LUI; and Report C-LUI. The new revision will include several modified services; Report P-LUI/C-LUI Identifier, Set P-LUI/C-LUI Identifier, Exchange P-LUI/C-LUI, Remove P-LUI/C-LUI, Add P-LUI/C-LUI, Create/Modify P-LUI/C-LUI Spare, and Report P-LUI/C-LUI Spare. A request for a new general service also will be honored in the next revision; Report P-LUI/C-LUI Attachment/Association.

George reported that no changes have been requested in the SCSI-3 Addressing document (94-031r2). It will be submitted to X3T10 as soon as practical. George reported that the SDA Commands and Mode Page document (94-042r2) must be revised to reflect the C-LUI changes. George reported that the SDA States and Types document (94-041r2) also requires changes to reflect C-LUIs. George reported that the Error Handling for SCSI Controllers document (94-024r2) contains a very long list of proposed new ASC/ASCQ codes. George and others feel that the proposed ASC/ASCQ list needs to be scrubbed.

The complete RAID Study Group minutes can be found in X3T10/94-062.

9. Old Business

9.1 Technical Information Bulletins

Gary Stephens had prepared a TIB on the tape partition issue. Folks are advised to review it. It is anticipated that a forwarding motion will be taken soon.

Gary noted that a very old TIB on LOG SENSE (X3T9.2/90-165) also needs processing. John took an action item call Lynn Barra to resurrect the LOG SENSE TIB.

9.2 Revised GPP Project Proposal [Milligan]

Norm Harris reported that Adaptec, after internally discussion, had concluded that discussion was terminated prematurely on the motion to change GPP to a technical bulletin. Therefore, Norm moved that the previous decision be reconsidered. Dal Allan seconded the motion.

After a lengthy discussion, the committee reached a point where further alternative action was generally desired. Insufficient information was available regarding specific changes in scope for GPP. No preferred direction could be found for action with respect to project proposal changes or GPP document changes. John asked if there were any objections to withdrawing the motion to reconsider. No objections were heard and, in effect, action on GPP was deferred to the next Plenary meeting.

10. New Business

10.1 Results of SPI Public Review

John reported that public review closed on February 25, 1994. One comment was received, from X3T10. The comment asked that SCAM be incorporated in the standard as a normative annex.

Ed Gardner moved that the public review comment be accepted by X3T10. Gene Milligan seconded the motion. The motion passed 39:1:0:20. Larry Lamers took the action item to incorporate SCAM in SPI.

10.2 Results of Flexible Disk Public Review

The public review period closed February 13, 1994. No comments were received. The recommendation is now at X3 letter ballot, which closes April 20, 1994.

10.3 Results of FCP Letter Ballot

John reported the FCP letter ballot results:

FCP Letter Ballot Results: 47 Yes, 2 No, 0 Abstain, 11 Did not return ballot

Yes, with
comment: IBM, Unitrode

No: FSI, Seagate

Did not
return ballot: Advanced Micro Devices, Cirrus Logic, Conner Peripherals, Distributed Processing Technology, Harting Electronik, Maxtor, National Semiconductor, Oak Technology, P. E. Logic, Rancho Technology, and Samsung

FCP has passed this ballot, but X3T10 must make an effort to resolve the comments. Since Bob Snively, FCP Editor, cannot complete this effort prior to the mailing deadline, the current plan is for Bob to mail a revised FCP document directly to the X3T10 members at least two weeks prior to the May '94 X3T10 meeting.

Expect motions to approve the responses and to approve the substantive changes to FCP at the May meeting.

John accepted an action item to distribute the FCP voting results and comments to the SCSI and FC

Reflectors.

10.4 Review of new documents

Steve Finch noted his new document (94-072) describing errors in SPI.

Steve Finch presented a document describing Updated Mode 4 16.6 Mbyte/sec timing for ATA-2 (94-045r2). Steve asked everyone consider this document carefully. He will be seeking an approval vote at the next Plenary meeting.

10.5 Withdrawal or Reaffirmation of ANSI X3.170-1989, Enhanced Small Device Interface (ESDI)

The ESDI standard is up for its five-year review cycle. Jim McGrath moved that X3T10 recommend reaffirmation of ANSI X3.170-1989, Enhanced Small Device Interface (ESDI). Ed Gardner seconded the motion.

A clarification of the options was requested. John noted that withdrawal or reaffirmation will include a four month public review. Gene Milligan noted that the ISO version of the ESDI standard is close to publication. The motion passed 39:4:0:17. Three no votes were based on the belief that ESDI is a dead interface. John took an action item to inform X3 of the decision to reaffirm ESDI.

10.6 Forwarding motions on ATA-3 Project Proposals (ATA3-PH, ATA3-XPT, ATA3-PI, and ATA3-BC)

Steve Finch moved that Project Proposals for ATA3-PH, ATA3-XPT, ATA3-PI, and ATA3-BC be forward to X3. Bob Masterson seconded the motion.

Concerns were raised about the scope sections in ATA3-PI and ATA3-BC. The two scope sections are virtually identical. John asked if there were any objections to withdrawing the motion to forward. No objections were heard. John announced that all four project proposals will be processed using letter ballots.

Owing to general confusion regarding the proposed ATA-3 document set, Steve Finch reviewed the ATA-3 document relationship diagram.

10.7 SPI-2 Project Proposal and Ultra SCSI Status Report [Ham]

John requested guidance from the committee regarding how best to standardize the Ultra SCSI work already in progress. Options considered were creating a new project proposal and folding Ultra SCSI in SPI. Many representatives noted the industry excitement regarding Ultra SCSI and hoped that its standardization could proceed as quickly as possible.

John noted a couple key don'ts expressed by the committee. Don't tie Ultra SCSI to a connector. Don't unnecessarily break upward compatibility from Fast SCSI to Ultra SCSI.

John thanked the committee for their advice.

Bill Ham reported on the break-neck progress of the Ultra SCSI work. Since the beginning of the year, several meetings have gathered the silicon vendors and system houses interested in Ultra SCSI. Much performance data and signal integrity data have been collected and reviewed.

10.8 Authorization to edit SPI document

Dal Allan moved that X3T10 authorize editing work per the quotation in 94-082. Erich Oetting seconded the motion. The motion passed unanimously.

10.9 Call for Volunteers - X3T10 Chair, Vice-Chair, and International Representative

John announced that there are a calls for volunteers for X3T10 chair and vice-chair.

11. ISO [Milligan]

Gene Milligan, the acting X3T10 International Representative, gave an oral report and provided the following electronic report:

ISO Report
March 1994

At the last series of meetings the acting IR reported that he expected the changes at the SC 25 Secretariat with the appointment of Walter v. Pattay would result in significant improvements in the processing time of the international versions of our standards projects. This has proved to be correct and there is now a plethora of international matters to act upon.

Somewhat ironically, with the renewed vigor at SC 25 the retirement of X3T9 without having taken a position on how the ongoing SC 25 work should be handled could have slowed the activity on the U.S. end. Although the SC 25 TAG Secretariat and the SC 25 WG 4 Secretariat had not been informed of any official transition plan the acting IR has unilaterally informed them that he would be the acting IR for X3T10, X3T11, and X3T12 until further notice. This will enable ongoing processing hopefully without interruption. The SC 25 Secretary has been informed of essentially the same information.

In addition to numerous liaison statements which the July SC 25/WG 4 delegation can address in executive session, the following items have been issued by the SC 25 Secretary or the JTC 1 TAG Administrator which require action by X3T10, X3T11, or X3T12:

X3T10:

A recommendation on the FDD standard 9315:1989 whether this ISO standard represents the best possible solution at this time; whether actual practice is consistent with the ISO standard; and whether the ISO standard should be confirmed for another five years, revised and if so why, or withdrawn with reasons; and finally if it is to be revised whether or not we are prepared to participate in the development of the revision.

The equivalent request concerning the SCSI standard 9316:1989. Both of these requests have a JTC 1 TAG deadline of 4/25/94 to line up with a JTC 1 deadline of 6/30/94.

With regard to the questions on SCSI 9316:1989 it should be pointed out that SCSI-2 has been issued as DIS letter ballot 9316-1 closing 8/24/94. The JTC 1 TAG pushback date is not yet known

X3T11:

In a similar vein X3T11 is required to make the equivalent set of recommendations on the Data processing - Description of interface between process computing system and technical process ISO 6548. The deadline is also 4/25/94. This one is a bit more convoluted. Somewhat in deference to earlier sponsorship of this standard by Germany, the X3T9 vote at the SC 25 level was to reaffirm. However Germany voted to withdraw. The U.S. delegation to the 1993 meeting was persuaded by their arguments and now recommends that we support their 1993 position in our recommendation to the JTC 1 TAG.

CD 14165-1 (FC-PH) has been distributed with closing date of 6/3/94. The X3 and SC 25 TAG pushback dates are not yet known. Because FC-PH was bigger than ANSI cared to distribute as an information copy, the CD was inadvertently distributed by the SC 25 Secretariat only through the table of contents of Rev 4.0. Consequently the acting IR assisted the SC 25 Secretary by rushing a copy Rev 4.0 for a second distribution. Of course it is not known what ultimate confusion will result among other nations over this surprising event.

CD 11518-6 HIPPI-SC Revision 2.6 dated 1/29/93 has been issued with the same closing date of 6/3/94 and unknown push back dates as have:

CD 11518-2 HIPPI-FP Revision 4.3 dated 1/29/93
 CD 11518-3 HIPPI-LE Revision 3.4 dated 1/29/93
 CD 9318-6 IPI enhanced PHY dated 1/4/93.

X3T12:

X3T12 is required to make an equivalent set of recommendations on the disposition of ISO 9314-1:1989 FDDI PHY and 9314-2:1989 FDDI MAC.

Like the CDs noted above CD 9314-13 FDDI CT-PICS Revision 3.4 dated 5/28/93 has been issued. The acting IR is recommending a letter ballot position presenting the changes necessary to bring the eventual DIS up to the dpANS Revision 3.4.

In addition CD 9314-8 FDDI MAC-2 Revision 5 dated 12/21/92 has been issued with the same deadline and unknown pushback dates.

The miscellaneous liaison and other reports covered: N134 Disposition of comments to DTR 12075 "Planning and Installation Guide for CPC to support ... Token Ring Stations; N135 Liaison report to SC 6 concerning 2.048 Mb/s and PHY layers; N144 Disposition of DIS 9314-5 FDDI HRC comments; N149 Liaison from SC 27, IEC TC 46, SC 46A, 46C, 86A, 86B, and 86 C to JTC 1?SC 25; N152 Draft Agenda SC 25/WG 4; N154 Disposition of comments DIS 9318-5 IPI-2 Tape with N 41(?); N155 Programme of Work Status; N158 Liaison from SC 25 to ITU TS WG XVIII/3 concerning 100 ohm and 120 ohm cables for ISDN primary access; N159 Liaison report to IEC/SC 46D concerning connector IEC 603-7 and LCL Testing; N160 Liaison statement to IEC/SC 86B concerning FO Connectors; N161 Liaison to IEC/SC 46A concerning Test Method for Transfer Impedance;

At an earlier meeting a forerunner of X3T10 voted to withdraw the ANS FDD standard and replace it with the ISO version 9315:1989. 9315 is now due for its five year review. Consequently, as acting IR, Gene Milligan moved that X3T10 recommend the following answers to the four questions:

- 1) 9315:1989 FDD represents the best possible solution for international application at this time.
- 2) Actual practice is consistent with 9315:1989 FDD.
- 3) X3T10 is in favor of confirmation of 9315:1989 FDD.
- 4) If the voting results in a need for revision of 9315:1989 FDD, X3T10 is prepared to participate in review and comment on proposed revisions. However X3T10 is not likely to offer a project editor for such a revision.

Steve Heil seconded the motion. The motion passed 34:0:0:25.

The forerunners of X3T10 and SC 25 have previously recommended that from a planning standpoint the ISO SCSI standard 9316:1989 be replaced with the eventual ISO SCSI-2 standard. Consequently, as acting IR, Gene Milligan move that X3T10 recommend the following answers to the four questions:

- 1) 9316:1989 SCSI no longer represents the best possible solution for international application.
- 2) Actual practice is no longer consistent with 9316:1989 SCSI. It has been overtaken in a downward compatible manner by DIS 9316-1 SCSI-2.
- 3) X3T10 is in favor of withdrawal of 9316 upon publication of 9316-1 SCSI-2 for the reason noted in the answer to question 2.
- 4) If the voting results in a need for revision of 9316:1989 SCSI X3T10 is not prepared to participate in review and comment on a proposed revisions and is not likely to offer a project editor for such a revision.

Steve Heil seconded the motion. The motion passed 34:0:0:25.

Although the pushback date is not yet known and there could be time at a later meeting, Gene Milligan saw no reason for deferring action on the SCSI-2 DIS. Consequently, as acting IR, Gene Milligan moved that X3T10 recommend approval of DIS 9316-1 SCSI-2. Steve Heil seconded the motion. The motion passed 34:0:0:25.

Based upon the ESDI discussions under New Business Items, as IR, Gene Milligan moved that X3T10 instruct the IR that if the SC 25 Secretariat determines that ISO/IEC 10 has not been published, the IR take steps to discontinue publication of the standard. Dal Allan seconded the motion. The motion was passed 34:0:0:25.

John requested that persons interested in attending the ISO SC-25 working groups meetings beginning on July 4th in Denmark identify themselves. Gene Milligan and Larry Lamers said that they would be attending. Gene said that Roger Cummings indicated that he and Horst Truestead would volunteer from X3T11.

12. Liaison Reports

12.1 X3T11 Liaison Report [Cummings]

94 people attended the February X3T11 Plenary.

Initial membership in X3T11 is 49 organizations.

FC-PH Second Public Review closed 2/15/94 with comments from X3T9.3 and IBM. Comment resolution is expected in 3/94.

FC-FP Revision 2.1 is in First Public Review, closing 5/21/94.

X3T11 Letter Ballots, closing 4/13/94, for forwarding for 1PR for:

- HIPPI-FP Amendment, Revision 1
- FC-AL (Arbitrated Loop), Revision 4.2
- FC-SB (Single Byte Command Code Sets), Revision 3.0

SD-3 for FC-GS (Generic Services) forwarded to X3.

Work on FC-EP starting in earnest:

- First proposals for 2,4&8 gigabit variants
- Additional copper variants (e.g. STP-5)
- Buffered Class 1 operation, data compression

Work on ATM mapping proposals also now underway.

12.2 SFF Industry Group [Allan]

Dal Allan requested that future agenda replace "Small Form Factor" be replaced with SFF.

Dal reported on two connector decisions taken by SFF. SFF has a document (SFF-8017) showing 26 tables of mix-and-match SCSI cabling. Dal recommends obtaining a copy of mix-and-match document. Dal reported that the document describing the unitized-parallel connector for rack applications will be revised and distributed for letter ballot vote.

Sun Microsystems has provided a copy of the SCA (Single Connector Attach) without copyright for distribution as SFF-8015.

The BIOS and software limitations of drives >528 MB was renamed to be <=8GB and a new revision will incorporate recommendations on the translation of CHS defined by Identify Drive parameters.

The Unitized Parallel Connector SFF-8009 will be revised to add dimensions so that the mating interface of the three connectors (68-pin P-cable, 12-pin 2mm Features, 4-pin Power) will have the same spacing between them.

12.3 IEEE P1394 [Marazas]

Jerry Marazas reported that the IEEE P1394 committee approved distribution of a 30-day letter ballot to approve forwarding of P1394 to IEEE MSC for public review. The IEEE MSC meets on May 9. If IEEE MCC approves, P1394 will be placed in public review. If no problems are identified during the public review, P1394 will become an IEEE standard and the committee will dissolve.

12.4 IT8 [Lohmeyer]

No report.

12.5 IEEE P1285 Status [Pak]

Dennis Pak provided a written liaison report, which can be found in document 94-076. The committee accepted the report without comment.

12.6 PCMCIA Report

Larry Barnes described the history, problems, and current status of efforts to put SCSI on PCMCIA cards. Larry noted several restrictions of SCSI on PCMCIA. Larry noted that only single ended SCSI will work in this environment. Cable lengths will be 1.5 meters or less. Only three drops can be supported.

Specific cable layout, connector issues, and termination issues produced significant amounts of discussion. Several X3T10 representatives showed some frustration regarding some of the PCMCIA choices, particularly regarding connectors and termination. Also, several PCMCIA organizational practices generated controversy.

Gene Milligan questioned whether placing the REQ and ACK signals in same bundle was inviting crosstalk problems and wondered whether grouping REQ and ACK separately with data signals would be better. Bob Snively responded that Sun had experimented with such a cable grouping and had found that placing REQ and ACK in the same bundle is superior. Consequently, there were no specific recommendations regarding the cable.

The slides from Larry's presentation can be found in document 94-077.

12.7 AIIM C21 [Podio]

William Burr reported on ANSI/AIIM MS59-199x, a Media Error Monitoring and Reporting Technique for Verification of Information Stored on Optical Digital Data Disk. This work is of interest to organizations that store data for long periods of time (e.g., the Library of Congress). The standard specifies the methods for reporting reallocated sectors, corrections above a specified threshold, number of errors, uncorrected data, and errors in header information. The standard extends the definitions of the SCSI MODE SELECT and INQUIRY commands. Vendor unique mode page and vital product data pages have been defined. Requests were made for SCSI-3 mode page codes.

The committee members were not pleased with the use of mode pages. Log sense pages were suggested as the correct place for error information reporting. Specific details of the objections were presented. John recommended that Fernando Podio contact Gary Stephens or Ralph Weber for guidance. John further recommended that Fernando attend the May meetings in Harrisburg.

Steve Heil reported that ISO SC-23 and ISO SC-15 (technical committees in the optical disk industry) have concerns regarding this work.

George Penokie moved that X3T10 notify Fernando Podio that unless he can prevent ANSI/AIIM MS59-199x from moving forward, the Chairman of X3T10 will forward a letter to AIIM and/or BSR stating that MS59-199x may have unexpected and undesirable impact on the SCSI devices that have to support the specified functions. Gary Stephens seconded the motion. The motion passed 21:1:0:38. John took an action item to monitor AIIM activities in C21 and write the letter if necessary.

Chair's note: On 3/22/94, Fernando Podio contacted the chair to say that C21 would hold up the draft standard until the issues can be resolved.

Bill's report can be found in document 94-083.

13. Review of Action Items

- 10) John Lohmeyer will contact Lynn Barra to resurrect the LOG SENSE TIB (X3T9.2/90-165).
- 11) Larry Lamers will incorporate SCAM in SPI.
- 12) John Lohmeyer will write a letter accepting the SPI public review comment regarding SCAM.
- 13) John Lohmeyer will inform X3 of the recommendation to reaffirm ESDI (ANSI X3.170-1989).
- 14) John Lohmeyer will monitor AIIM activities in C21 (ANSI/AIIM MS59-199x) and write the letter if necessary.
- 15) Bob Snively will investigate liaison with IEEE P1244.5.

14. Meeting Schedule

The next plenary meeting of X3T10 will be May 18, 1994, in Harrisburg, PA, at the Sheraton Inn Harrisburg (717-561-2800), hosted by AMP, Inc. The meeting will begin at 1:00 pm on Thursday and at 8:30 am on Friday (if necessary).

The meeting list for the next plenary week is:

May '94 Meeting Map

	9	10	11	12	1	2	3	4	5	6	7	8	
Monday 5/16	+=====+												
	SCSI CAM Working Group												(25)
	+=====+												
									SSA XCVR WG				(20)
	+=====+												
Tuesday 5/17	+-----+												
	X3T10.1 / SSP / SSA-UIG												(40)
	+-----+												
	RAID SG & RAB Joint Meeting												(40)
	+-----+												
	IEEE P1394 Plenary												(30)
	+-----+												
	P1394 Connector Task Group (?)												(15)
	+-----+												
Wednesday 5/18	+=====+												
	SCSI-3 WG (includes LB resolution)												(45)
	+=====+												
	P1394 Plenary Meeting												(30)
	+-----+												
Thursday 5/19	+=====+												
	ATA WG X3T10 Plenary												(40/80)
	+=====+												
Friday 5/20	8	9	10	11	12	1	2						
	+-----+												
	X3T10 (*) / SFF												(80)
	+-----+												

(*) If X3T10 meeting runs until Friday, Small Form Factor will follow the X3T10 meeting; Otherwise, SFF starts at 8:30 am.
 Meetings marked with == are X3T10-authorized meetings.
 Meetings marked with -- are authorized by other groups and may change without notice.

- Meeting Map Abbreviation Key:
- ATA: AT Attachment (a.k.a. IDE)
 - CAM: Common Access Method
 - Gen Edit Sess: General Editing Session
 - LB: Letter Ballot
 - P1394: IEEE Project on High Performance Serial Bus (not an X3 activity)
 - Plenary: Full Committee Meeting
 - RAB: RAID Advisory Board (not an X3 activity)
 - RAID: Redundant Array of Independent Devices
 - SFF: Small Form Factor Industry Group (not an X3 activity)
 - SG: Study Group
 - SSA: Serial Storage Interface
 - SSP: Serial Storage Protocol (Protocol for SSA)
 - UIG: User Interest Group (not an X3 activity)
 - WG: Working Group (same as Ad Hoc Group)
 - X3T10: Lower Level Interfaces Technical Committee (was X3T9.2)
 - X3T10.1: SSA Task Group of X3T10 (was X3T9.7)
 - XCVR: Transceiver (physical layer specification)

Several other X3T10 events are also planned:

Event	Day/Date	Time	Location/contact
ATA Working Group	Wed 3/30	9a - 5p	Milpitas/Finch
ATA Working Group	Wed 4/27	9a - 5p	Milpitas/Finch
ATA Working Group	Thu 5/19	9a - 12p	Harrisberg/AMP
ATA Working Group	Wed 6/1	9a - 5p	Milpitas/Finch
Ultra SCSI Working Group	Thu 3/31	9:30-4p	Milpitas/McGrath
Ultra SCSI Working Group	TBD	end April	TBD
RAID Study Group	Tue 4/19	9a - 5p	Bellevue/Penokie
FCP LB Resolution	Mon 4/18	TBD	Bellevue/Snively

For more information about X3T10 activities, please contact the following people:

Activity	Contact	Telephone/Email
CAM Working Group	Bill Dallas	(603) 881-2508 dallas@wasted.enet.dec.com
ATA Working Group	Steve Finch	(714) 573-6808 5723283@mcimail.com
GPP Working Group	Gary Stephens	(602) 321-1725 6363897@mcimail.com
MMC Study Group	Norm Harris	(408) 945-8600 x2230 nharris@adaptecc.com
SSC Contact	Edward Lappin	(303) 447-7718 tedl@exabyte.com
SPC Contact	Ralph Weber	(603) 881-1497 weber@star.enet.dec.com
RAID Study Group	George Penokie	(507) 253-5208 gop@rchvmp3.vnet.ibm.com
SAM Working Group	Charles Monia	(508) 841-6757 monia@starch.enet.dec.com
SBP Working Group	Jerry Marazas	(407) 982-4423 marazas@bcrvmpc2.vnet.ibm.com
SPI Contact	Larry Lamers	(408) 432-4776 71540.2756@compuserve.com
SIP Contact	Larry Lamers	(408) 432-4776 71540.2756@compuserve.com
SCAM Contact	Ed Gardner	(719) 548-2247 gardner@ssag.enet.dec.com
Other Activities	John Lohmeyer	(719) 573-3362 john.lohmeyer@ftcollinsco.ncr.com

The long-term X3T10 meeting week schedule is:

Date	Location	Host/Comments
May 16-20, 1994	Harrisburg, PA	AMP
Jul 18-22, 1994	Manchester, NH	DEC
Sep 12-16, 1994	Houston, TX	Compaq
Nov 7-11, 1994	Palm Springs, CA	Western Digital

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 X3T10 (that is, one vote per organization) and the results of a working group are not binding on the parent committee. This later requirement is why we have traditionally only used non-binding straw polls in working group meetings. Any issue where the voting rules would make a difference is automatically deferred to the plenary group.

Jeff Stai moved and Neil Wanamaker seconded that X3T10 authorize the X3T10-related meetings and events in the list above. The motion passed unanimously.

14.2 Authorization of 1995 Meeting Dates, Locations, and Hosts

John Lohmeyer presented a foil (summarized below) showing the proposed 1995 meeting dates, locations, and hosts.

The long-term X3T10 meeting week schedule is:

Date	Location	Host/Comments
Jan 8-13, 1995	Lake Tahoe, NV	SSI
Mar 5-10, 1995	Newport Beach, CA	QLogic
May 7-12, 1995	Harrisburg, PA	AMP
Jul 9-14, 1995	Colorado Springs, CO	NCR
Sep 10-15, 1995	Manchester, NH	Digital
Nov 5-10, 1995	Southern CA	Western Digital

Dal Allan moved that X3T10 accept the proposed 1995 meeting dates, locations and hosts. Steve Finch seconded the motion. The motion passed 18:1:0.

14.3 Notification of Meeting Hosts Regarding Schedule Changes

Dal Allan moved:

- 1) that all committees provide the host with a firm meeting schedule 30 days prior to the actual meeting week.
- 2) that additional meeting requirements within the 30 day window be arranged directly with the hotel, with the costs born by the requesting organization, and not involving the host.
- 3) that cancelations must be made through the host, with the canceling organization financially responsible for any cost incurred by the host related to the cancelation.

Jeff Stai seconded. The motion passed unanimously.

15. Adjournment

The meeting was adjourned at 8:38 p.m. on Thursday March 17, 1994.

Meeting Attenders -- Enclosure (1)

Name	S	Organization	Electronic Mail Address
Mr. Rick Heidick	A	3M Company	
Mr. Norm Harris	P	Adaptec, Inc.	nharris@adaptec.com
Mr. Lawrence J. Lamers	A	Adaptec, Inc.	ljlammers@adaptec.com
Mr. Neil T. Wanamaker	P	Amdahl Corp.	ntw20@eng.amdahl.com
Mr. Charles Brill	P	AMP, Inc.	cebrill@amp.com
Mr. Bob Whiteman	A	AMP, Inc.	whiteman@cup.portal.com
Mr. Ken Scherzinger	S	Amphenol Spectra Strip	
Mr. Scott Smyers	P	Apple Computer	smyers.s@applelink.apple.com
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Mr. Larry Barnes	V	AT&T/ NCR Microelectronics	larry.barnes@ftcollinsco.ncr.com
Mr. Steven Ramberg	A	BusLogic	
Mr. Gerry Johnsen	P	Ciprico Inc.	gerry@cipric.mn.org
Mr. Ian Morrell	A	Circuit Assembly Corp.	
Mr. Joe Chen	P	Cirrus Logic Inc.	chen@cirrus.com
Mr. Edward Haske	P	CMD Technology	
Mr. Michael Alexenko	A	Conner Peripherals	
Ms. Adrienne Turenne	A	Conner Tape	
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Mr. Nick Ladas	P	Foxconn	
Mr. Gary R. Stephens	P	FSI Consulting Services	6363897@mcimail.com
Mr. Robert Liu	P	Fujitsu Computer Products,Am	
Mr. Kevin R. Pokorney	A	Fujitsu Computer Products,Am	pokorney@intellistor.com
Mr. Mark Woithe	P	Future Domain Corp.	markw@fdc.mhs.compuserve.com
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Mr. Ray Kallio	P	Harbor Electronics	
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Mr. Peter Stevens	O	Hirose Electric (USA), Inc.	4733436@mcimail.com
Mr. George Penokie	P	IBM Corp.	gop@rchvmp3.vnet.ibm.com
Mr. Ken Cummings	O	IBM Corp.	kenc@tucvm2.vnet.ibm.com
Dr. Gerald Marazas	A	IBM PC Company	marazas@bcrvmpc2.vnet.ibm.com
Mr. David Lawson	P	Interphase Corp.	lawson@iphase.com
Mr. Geoffrey Barton	O	Iomega Corp.	glbarton@iomega.com
Mr. Dean Wallace	P	Linfinity Micro	
Mr. Chuck Grant	A	Madison Cable Corp.	
Mr. Randy Speer	A	Maxoptix Corp.	
Mr. Bob Masterson	P	Method Electronics, Inc.	
Mr. Clifford Carlson	O	NCCOSC RDTE DIV 821	wcarlson@nosc.mil
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Mr. Thomas Steury	P	Pacific Electro Data Inc.	
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Mr. Duncan Penman	O	Zadian Technologies	

70 People Present

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

Minutes of X3T10 Plenary Meeting #2 in Newport Beach, CA

X3T10/94-074r0

Mar 24, 1994 - X3T10 Membership - Enclosure (2)

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Minutes of X3T10 Plenary Meeting #2 in Newport Beach, CA

X3T10/94-074r0

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Minutes of X3T10 Plenary Meeting #2 in Newport Beach, CA

X3T10/94-074r0

Mar 24, 1994 - X3T10 Document Register - Enclosure (3)

X3T10/94-001R0 Date: Author: J. Lohmeyer []
Desc: Final X3T9.2 Annual Report
Res:

X3T10/94-002R0 Date: 1/25/94 Author: J. Lohmeyer [2/15/94]
Desc: X3T10 Project Status Summary
Res:

X3T10/94-003R0 Date: 1/24/94 Author: J. Lohmeyer [2/15/94]
Desc: Draft Agenda for X3T10 Meeting - Mar '94
Res:

X3T10/94-004R0 Date: Author: J. Lohmeyer []
Desc: Draft Agenda for X3T10 Meeting - May '94
Res:

X3T10/94-005R0 Date: Author: J. Lohmeyer []
Desc: Draft Agenda for X3T10 Meeting - July '94
Res:

X3T10/94-006R0 Date: Author: J. Lohmeyer []
Desc: Draft Agenda for X3T10 Meeting - September '94
Res:

X3T10/94-007R0 Date: Author: J. Lohmeyer []
Desc: Draft Agenda for X3T10 Meeting - November '94
Res:

X3T10/94-008R0 Date: Author: J. Lohmeyer []
Desc: Draft Agenda for X3T10 Meeting - January '95
Res:

X3T10/94-009R0 Date: Author: J. Lohmeyer []
Desc: Jeopardy Letter
Res:

X3T10/94-010R0 Date: 12/7/93 Author: G. Penokie [2/15/94]
Desc: Minutes of Raid Study Group - Dec '93
Res:

X3T10/94-011R0 Date: 1/11/94 Author: G. Penokie [2/15/94]
Desc: Minutes of Raid Study Group - Jan '94
Res:

X3T10/94-012R0 Date: 1/21/93 Author: Lamers/Finch [2/15/94]
Desc: Minutes of ATA Working Group - Jan '94
Res:

X3T10/94-013R0 Date: 1/21/94 Author: Lamers/Lohmeyer [2/15/94]
Desc: Minutes of General Working Group - Jan '94
Res:

X3T10/94-014R0 Date: 11/22/94 Author: R. Snively [2/15/94]
Desc: Response to Comments for FCP
Res:

X3T10/94-015R0 Date: 1/12/94 Author: R. Weber [2/15/94]
Desc: Minutes of the CAM Working Group - Jan '94
Res:

X3T10/94-016R0 Date: 1/21/94 Author: Lamers/Lohmeyer []
Desc: Minutes of X3T10 Meeting #1 - Jan '94
Res:

X3T10/94-016R1 Date: 1/25/94 Author: Lamers/Lohmeyer [2/15/94]
Desc: Minutes of X3T10 Meeting #1 - Jan '94
Res:

X3T10/94-017R0 Date: 1/13/94 Author: J. Scheible [2/15/94]
Desc: Minutes of X3T10.1 Meeting #1 - Jan '94
Res:

X3T10/94-018R0 Date: Author: R. Weber [2/15/94]
Desc: Processor Commands for SPC
Res:

X3T10/94-019R0 Date: 1/14/94 Author: S. Finch [2/15/94]
Desc: Project Proposal - ATA-PH3
Res:

X3T10/94-019R1 Date: 2/11/94 Author: S. Finch [4/15/94]
Desc: Project Proposal - ATA3-PH
Res:

X3T10/94-020R0 Date: 1/14/94 Author: S. Finch [2/15/94]
Desc: Project Proposal - ATA3-XPT
Res:

X3T10/94-020R1 Date: 2/11/94 Author: S. Finch [4/15/94]
Desc: Project Proposal - ATA3-XPT
Res:

X3T10/94-021R0 Date: 1/14/94 Author: S. Finch [2/15/94]
Desc: Project Proposal - ATA3-PI
Res:

X3T10/94-021R1 Date: 2/11/94 Author: S. Finch [4/15/94]
Desc: Project Proposal - ATA3-PI
Res:

X3T10/94-022R0 Date: Author: S. Finch [2/15/94]
Desc: Project Proposal - BC
Res:

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X3T10/94-074r0

X3T10/94-022R1 Date: 2/11/94 Author: S. Finch [4/15/94]
Desc: Project Proposal - ATA3-BC
Res:

X3T10/94-023R0 Date: 1/12/94 Author: B. Ham [2/15/94]
Desc: Ultra-SCSI Update 1
Res:

X3T10/94-024R0 Date: 1/5/94 Author: D. Hagerman [2/15/94]
Desc: Error Handling for SCSI Controllers
Res:

X3T10/94-025R0 Date: 1/5/94 Author: D. Hagerman [2/15/94]
Desc: Additional Device Models
Res:

X3T10/94-026R0 Date: 1/5/94 Author: D. Hagerman [2/15/94]
Desc: Comments on SDA States
Res:

X3T10/94-027R0 Date: 12/6/93 Author: R. Kalish [2/15/94]
Desc: Proposal for Data CRC across the Cable
Res:

X3T10/94-027R1 Date: 1/20/94 Author: R. Kalish [4/15/94]
Desc: Proposal for Data CRC across the Cable
Res:

X3T10/94-028R0 Date: Author: C. Monia [2/15/94]
Desc: Summary of Proposed Responses to Comments on SAM, revision 12
Res:

X3T10/94-029R0 Date: Author: C. Monia [2/15/94]
Desc: Summary of Proposed SAM responses for Working Group Discussion
Res:

X3T10/94-030R0 Date: Author: C. Monia [2/15/94]
Desc: Key Issues from Review of SAM, Revision 12
Res:

X3T10/94-031R0 Date: Author: G. Penokie [2/15/94]
Desc: SCSI Logical Unit Addressing
Res:

X3T10/94-032R0 Date: Author: G. Houlder [2/15/94]
Desc: Message Handling
Res:

X3T10/94-033R0 Date: Author: R. Snively [2/15/94]
Desc: Fibre Channel Icon Proposal
Res:

X3T10/94-034R0 Date: Author: OMC [2/15/94]
Desc: Presentation on X3 Procedures
Res:

X3T10/94-035R0 Date: Author: D. Hagerman [2/15/94]
Desc: Project Proposal for SCSI-3 Controller Commands
Res:

X3T10/94-035R1 Date: 2/4/94 Author: D. Hagerman [4/15/94]
Desc: Project Proposal for SCSI-3 Controller Commands
Res:

X3T10/94-036R0 Date: Author: Lohmeyer/Harris [2/15/94]
Desc: Project Proposal for Multi-Media Command Set
Res:

X3T10/94-036R1 Date: 2/4/94 Author: Lohmeyer/Harris [4/15/94]
Desc: Project Proposal for Multi-Media Command Set
Res:

X3T10/94-037R0 Date: 1/14/94 Author: D. Pak [2/15/94]
Desc: Liaison Report from P1285 - 1/94
Res:

X3T10/94-038R0 Date: 1/20/94 Author: P. Aloisi [2/15/94]
Desc: Proposed changes to SPI
Res:

X3T10/94-039R0 Date: 1/13/94 Author: D. Arnold [2/15/94]
Desc: Call for Volunteers - X3T10
Res:

X3T10/94-040R0 Date: 12/10/93 Author: G. Penokie [2/15/94]
Desc: SCSI Disk Array Model
Res:

X3T10/94-041R0 Date: 12/12/93 Author: G. Penokie [2/15/94]
Desc: SDA States and Types
Res:

X3T10/94-042R0 Date: 12/10/93 Author: G. Penokie [2/15/94]
Desc: SDA Commands & Mode Pages
Res:

X3T10/94-043R0 Date: 1/24/94 Author: C. Monia [2/15/94]
Desc: Results of 1/11/94 SAM WG Review
Res:

X3T10/94-044R0 Date: 1/24/94 Author: J. Lohmeyer [2/15/94]
Desc: Letter Ballot on FCP
Res:

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X3T10/94-074r0

X3T10/94-045R0 Date: 1/28/94 Author: T. Hanan [4/15/94]
Desc: 16.6 MB/Sec Timing
Res:

X3T10/94-045R2 Date: 3/16/94 Author: T. Hanan [4/15/94]
Desc: 16.6 MB/Sec Timing
Res:

X3T10/94-046R0 Date: Author: H. Landis [4/15/94]
Desc: Master/Slave Issues
Res:

X3T10/94-047R0 Date: Author: R. Shergill [4/15/94]
Desc: Minutes of ATA Working Group - 1/28/94
Res:

X3T10/94-048R0 Date: Author: T. Hanan [4/15/94]
Desc: Data Integrity Proposal
Res:

X3T10/94-049R0 Date: 2/7/94 Author: J. Lohmeyer [4/15/94]
Desc: Public review comment on SPI re adding SCAM as normative annex
Res:

X3T10/94-050R0 Date: 2/4/94 Author: W. Rinehuls [4/15/94]
Desc: ltr Rinehuls to Lohmeyer re IEEE P1244.5 PINS
Res:

X3T10/94-051R0 Date: 1/1/94 Author: J. Masiewicz [4/15/94]
Desc: Comments/Recommendations on ATA-2 working draft
Res:

X3T10/94-051R1 Date: 1/1/94 Author: J. Masiewicz [4/15/94]
Desc: Comments/Recommendations on ATA-2 working draft
Res:

X3T10/94-052R0 Date: 2/12/94 Author: T. Hanan [4/15/94]
Desc: Proposed Change to Mode 4 T0 definition and diagrams
Res:

X3T10/94-053R0 Date: 2/23/94 Author: R. Kalish [4/15/94]
Desc: RESET on the Bus
Res:

X3T10/94-054R0 Date: 2/22/94 Author: T. Hanan [4/15/94]
Desc: New Timing Modes
Res:

X3T10/94-055R0 Date: 2/25/94 Author: Shergill/Finch [4/15/94]
Desc: Minutes of ATA WG 23FEB94
Res:

X3T10/94-056R0 Date: 2/25/94 Author: T. Hanan [4/15/94]
Desc: DRQ Timing on Last Data Transfer
Res:

X3T10/94-057R0 Date: 2/25/94 Author: N. Harris [4/15/94]
Desc: Proposal for the working draft on Multit-Media Commands
Res:

X3T10/94-058R0 Date: 2/25/94 Author: J. Masiewicz [4/15/94]
Desc: Comments on ATA-2 Word 56-58
Res:

X3T10/94-059R0 Date: 2/25/94 Author: G. Penokie [4/15/94]
Desc: Minutes of RAID Study Group - 2/14/94
Res:

X3T10/94-060R0 Date: 3/2/94 Author: Ham/Lohmeyer [4/15/94]
Desc: Project Proposal for SCSI Parallel Interface -2
Res:

X3T10/94-061R0 Date: 3/13/94 Author: Lamers/Lohmeyer/Ham [4/15/94]
Desc: Ultra-SCSI Proposal
Res:

X3T10/94-062R0 Date: 3/10/94 Author: G. Penokie [4/15/94]
Desc: Minutes of RAID WG - March 14, 1994
Res:

X3T10/94-063R0 Date: 3/10/94 Author: H. Landis [4/15/94]
Desc: DMA Command Description Cleanup
Res:

X3T10/94-064R0 Date: 3/10/94 Author: H. Landis [4/15/94]
Desc: Power Management Description Cleanup
Res:

X3T10/94-065R0 Date: 3/10/94 Author: H. Landis [4/15/94]
Desc: Master/Slave Handshaking
Res:

X3T10/94-066R0 Date: 3/15/94 Author: Lamers/Finch [4/15/94]
Desc: Minutes of ATA WG - March 14, 1994
Res:

X3T10/94-067R0 Date: 2/2/94 Author: G. Houlder [4/15/94]
Desc: Data Recovery on Deferred Errors
Res:

X3T10/94-068R0 Date: 3/16/94 Author: B. Ham [4/15/94]
Desc: Ultra SCSI progress report
Res:

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X3T10/94-074r0

X3T10/94-069R0 Date: 3/11/94 Author: R. Snively [4/15/94]
Desc: Proposal for WRITE BUFFER command
Res:

X3T10/94-070R0 Date: 3/21/94 Author: Lamers/Lohmeyer [4/15/94]
Desc: Minutes of the X3T10 General Working Group - March 16, 1994
Res:

X3T10/94-071R0 Date: 3/21/94 Author: R. Gannon [4/15/94]
Desc: PCMCIA Cable Issues
Res:

X3T10/94-072R0 Date: 3/21/94 Author: S. Finch [4/15/94]
Desc: Minor errors in SPI
Res:

X3T10/94-073R0 Date: 3/21/94 Author: B. Dallas [4/15/94]
Desc: Minutes of CAM Working Group- 3/14/94
Res:

X3T10/94-074R0 Date: 3/21/94 Author: Weber/Lohmeyer [4/15/94]
Desc: Minutes of X3T10 Plenary Meeting #2
Res:

X3T10/94-075R0 Date: 3/21/94 Author: E. Gardner [4/15/94]
Desc: Presentation on ATM
Res:

X3T10/94-076R0 Date: 3/21/94 Author: D. Pak [4/15/94]
Desc: Liaison Report from P1285 - 3/95
Res:

X3T10/94-077R0 Date: 3/21/94 Author: L. Barnes [4/15/94]
Desc: Liaison Report from PCMCIA - 3/95
Res:

X3T10/94-078R0 Date: 3/21/94 Author: R. Cummings [4/15/94]
Desc: Liaison Report from X3T11-3/95
Res:

X3T10/94-079R0 Date: 3/21/94 Author: J. McGrath [4/15/94]
Desc: Comments on INQUIRY command
Res:

X3T10/94-080R0 Date: 3/21/94 Author: J. McGrath [4/15/94]
Desc: Comments on Download Microcode
Res:

X3T10/94-081R0 Date: 3/21/94 Author: J. McGrath [4/15/94]
Desc: Comments on optional/mandatory features
Res:

X3T10/94-082R0 Date: 3/21/94 Author: S. Smith [4/15/94]
Desc: Quotation on SPI ANSI editing
Res:

X3T10/94-083R0 Date: 3/21/94 Author: W. Burr [4/15/94]
Desc: Liaison report from AIIM - 3/94
Res:

X3T10/94-084R0 Date: 3/21/94 Author: F. Podia [4/15/94]
Desc: Media Error Reporting and Monitoring...
Res:

X3T10/94-085R0 Date: 3/21/94 Author: G. Marazas [4/15/94]
Desc: Letter Ballot comment resolution for SBP
Res: