

To: Membership of X3T10

From: Ralph Weber, Secretary X3T10  
Larry Lamers, Vice-chair X3T10  
John Lohmeyer, Chair X3T10

Subject: Minutes of SCSI Working Group Meeting  
Palm Springs, CA -- November 5-6, 1996

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### Agenda

1. Opening Remarks
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  - 5.2 SPI Amendment (855A) [Lamers\Lohmeyer]
6. Protocol Topics
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  - 6.2 Add Mode Page for Fibre Channel features (96-195) [Houlder]
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  - 6.4 Autosense Proposal for SCSI-3 (96-254r0) [Alvey]
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8. Other Topics
  - 8.1 Greater than 8GB Technical Report Review [Lamers/ ???]
  - 8.2 IP over SCSI (Reflector Message) [Lamers]
  - 8.3 SCSI roadmap, standards family bibliography, definition of SCSI vs. SCSI-3 [Lamers]
  - 8.4 SPI Clarification of TTD (96-268r0) [Penokie]
  - 8.5 DVD Issues with respect to MMC
  - 8.6 High-Availability Profile [Hagerman]
  - 8.7 SCSI-2 Defects [Milligan]

9. Meeting Schedule

10. Adjournment

Results of Meeting

1. Opening Remarks

John Lohmeyer, the X3T10 Chair, called the meeting to order at 9:00 a.m., Tuesday November 5, 1996. He thanked Norm Harris of Adaptec for hosting the meeting.

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:

- 6.5 Command Exception Conditions [Monia]
- 7.4 Public Review Comments on SPC [Monia & Penokie]
- 8.4 SPI Clarification of TTD
- 8.5 DVD Issues with respect to MMC
- 8.6 High-Availability Profile [Hagerman]
- 8.7 SCSI-2 Defects [Milligan]

3. Attendance and Membership

Attendance at working group meetings does not count toward minimum attendance requirements for X3T10 membership. Working group meetings are open to any person or organization directly and materially affected by X3T10's scope of work.

The following people attended the meeting:

Name	S	Organization	Electronic Mail Address
Mr. Norm Harris	P	Adaptec, Inc.	nharris@eng.adaptec.com
Mr. Lawrence J. Lamers	A	Adaptec, Inc.	ljlammers@aol.com
Mr. Edward Fong	P	Amdahl Corp.	esf10@amail.amdahl.com
Ms. Lisa Huff	V	AMP, Inc.	lisa.huff@amp.com
Mr. Gary Porter	A	Ancot Corp.	garyp@ancot.com
Mr. Ron Roberts	A	Apple Computer	rkroberts@aol.com
Mr. Richard Wagner	O	Cable Design Technologies	rwagner@montrose-cdt.com
Mr. Peter Johansson	P	Congruent Software, Inc.	pjohansson@aol.com
Mr. Greg McSorley	O	Data General Corp.	greg_mcsorley@dgc.ceo.dg.com
Mr. Charles Monia	P	Digital Equipment Corp.	monia@shr.dec.com
Mr. Douglas Hagerman	A#	Digital Equipment Corp.	hagerman@starch.enet.dec.com
Dr. William Ham	A#	Digital Equipment Corp.	ham@subsys.enet.dec.com
Mr. Tom Coughlan	V	Digital Equipment Corp.	tom.coughlan@zko.mts.dec.com
Mr. Roger Cummings	P	Distributed Processing Tech.	cummings_roger@dpt.com
Mr. Edward Lappin	P	Exabyte Corp.	tedl@exabyte.com
Ms. Constance Kephart	A#	Exabyte Corp.	conniek@exabyte.com
Mr. Mark Hammang	V	FCPA Intellistor (Fujitsu)	hammang@intellistor.com
Mr. George Penokie	P	IBM Corp.	gop@rchvmp3.vnet.ibm.com
Mr. Dan Colegrove	A#	IBM Corp.	colegrove@vnet.ibm.com

Mr. Geoffrey Barton	P	Iomega Corp.	glbarton@iomega.com
Mr. Robert Bellino	P	Madison Cable Corp.	robert_bellino@madisonusa.ccmail.compuserve.com
Mr. Pete McLean	P	Maxtor Corp.	pete_mclean@maxtor.com
Mr. Jay Neer	A	Molex Inc.	jneer@molex.com
Mr. Evgeny Jake Berzon	O	NEC Electronics, Inc.	jberzon@asic.mtv.nec.com
Mr. Edward A. Gardner	P	Ophidian Designs	gardner@acm.org
Mr. John A. Fobel	O	Rancho Technology, Inc.	johnf@rancho.com
Mr. Gene Milligan	P	Seagate Technology	Gene_Milligan@notes.seagate.com
Mr. Dave Guss	P	Silicon Systems, Inc.	dave.guss@tus.ssi1.com
Mr. Greg Alvey	V	Solution Technology	kd6nm@gnn.com
Mr. Erich Oetting	P	Storage Technology Corp.	Erich_Oetting@Stortek.com
Mr. Robert N. Snively	P	Sun Microsystems Computer Co	bob.snively@eng.sun.com
Mr. Vit Novak	A	Sun Microsystems, Inc.	vit.novak@sun.com
Mr. John Lohmeyer	P	Symbios Logic Inc.	john.lohmeyer@symbios.com
Mr. Ralph O. Weber	A#	Symbios Logic Inc.	roweber@acm.org
Mr. Rod DeKoning	A	Symbios Logic Inc.	rod.dekoning@symbios.com
Mr. Patrick Mercer	P	SyQuest Technology, Inc.	patrick.mercer@syquest.com
Mr. Tokuyuki Totani	P	Toshiba America	totani@ix.netcom.com
Mr. Kenneth J. Hallam	P	UNISYS Corporation	ken.hallam@mv.unisys.com
Mr. Paul D. Aloisi	P	Unitrode Corporation	aloisi@unitrode.com
Mr. Jeffrey L. Williams	P	Western Digital Corporation	jwilliam@wdroc.wdc.com

40 People Present

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

#### 4. EPI Topics

Bill Ham reviewed EPI revision 7 with the working group. The mixed width section was reviewed and it was agreed that the mixed width information is substantially complete. The length tables and expander section were reviewed. Bill agreed to produce a revision 8 for the next general working group meeting.

#### 5. Physical Topics

##### 5.1 Arbitration Fairness (96-172) [Lohmeyer]

The group agreed to put adding arbitration fairness, based on the 96-172 document, on the work list for SPUD (Larry's acronym for the SCSI Physical Unified Document otherwise known as SPI-2).

##### 5.2 SPI Amendment (855A) [Lamers\Lohmeyer]

The group discussed the SPI amendment. The revised roadmap figure (figure 1) was accepted as the resolution for comment 2. The group agreed to resolve comment 3 by adding the following wording to Clause 3.1: "In this standard the term SCSI-3 indicates the device conforms to SPI as amended." The group agreed to accept the new wording proposed in comment 4. The comments can be found in 96-038.

The group reviewed the amended SCAM annex in detail. After a lengthy discussion, it was agreed that bus signals would need to be referenced by name in some cases. Although descriptions based on service names were preferred as more consistent with SAM, the use of signal names was considered critical because no other naming method exactly specified the required behavior. Since SCAM is defined in the same document as the signals are defined (specifically SPI), it was agreed that the signal names could be used where necessary instead of the service names.

Several other substantive and editorial corrections, particularly in the SCAM annex, were identified and communicated to the technical editor. A revision of the SPI Amendment will be placed in the November mailing; the group believes that this revision resolves the letter ballot comments and expects it to be forwarded to first public review at the January '97 X3T10 meeting.

## 6. Protocol Topics

### 6.1 New Task Management Models for SAM (96-198r2) [Johansson]

Peter Johansson presented the latest revision of the simple queue management proposal. Concerns were raised about the mode page setup required by the proposal. The group argued over whether to allow the Qerr bit to be zero in the control mode page and failed to reach broad consensus on the matter. Peter moved that the group recommend the acceptance of the revised proposal for inclusion in SAM-2 and SPC-2. Ed Gardner seconded the motion. The motion passed 17:2. George Penokie and Jeff Williams stated their no votes as being based on objections to the requirements placed on the control mode page.

### 6.2 Add Mode Page for Fibre Channel features (96-195) [Houlder]

No information was available for presentation and action of this topic was deferred to the next general working group meeting.

### 6.3 Tape Support on FC-AL (Reflector Message) [Hagerman]

After noting that the SSC/SMC working group will discuss this topic, Doug asked that this agenda item be removed from future general SCSI working group agendas.

### 6.4 Autosense Proposal for SCSI-3 (96-254r0) [Alvey]

Greg Alvey presented his proposal for folding autosense data transfer into the parallel SCSI protocol. The discussion quickly turned to Contingent Allegiance and Auto Contingent Allegiance. The group had a lively discussion. Eventually, the costs of implementing the proposal were viewed as outweighing the advantages. Greg decided not to pursue the proposal further.

### 6.5 Command Exception Conditions (95-352r3) [Monia]

Charles Monia started his presentation by stating that he is looking for an up-or-down vote on the proposal, perhaps not at this meeting, but soon. The gist of the proposal was that a new ACA-like state be created for each of the following status values ACA ACTIVE, TASK SET FULL, RESERVATION CONFLICT, BUSY, and CHECK CONDITION with NACA zero. Charles received several comments on the proposal and advice for improving it. He agreed to prepare a revised proposal for distribution on the SCSI Reflector.

## 7. Command Set Topics

### 7.1 SPC-2

#### 7.1.1 Proposal for Additional Persistent Reservation Functions (96-263r0) [Coughlan]

Tom Coughlan presented a formal proposal adding "Write Exclusive, Registrants Only" as a persistent reservations type. The group discussed several aspects of the proposal. In many cases, the discussion was oriented toward improving the group's understanding of the intended operation of the proposal. In the absence of any objections, the group agreed to recommend that the plenary approve the proposal for inclusion in SPC-2.

#### 7.1.2 Questions on Persistent Reservations (reflector message) [Monia]

Charles stated that he thought the issue behind this agenda item had been resolved at the last general working group meeting. The group agreed to remove this item from the agenda.

### 7.1.3 SPC Link Event Timeout (96-248r0) [Stephens]

Gary Stephens was not present at the meeting. Action on this topic was deferred to a future working group meeting.

### 7.2 SBC [Milligan]

Gene Milligan described the changes in SBC revision 6. Several issues were discussed and Gene noted their resolutions.

A private communication from H. Curley generated proposed actions. Mr. Curley noted that the SPC COPY command describes a CD-ROM as a block device. However, SBC (SCSI-3 Block Commands) does not include CD-ROM devices. MMC describes itself as covering audio, video, and multi-media devices, which also does not cover CD-ROM.

The matter of making SEEK, REZERO UNIT, and the SEARCH DATA XXX commands obsolete was revisited. It was noted that the working group has previously supported and refused to support making SEEK obsolete. Dependencies from MMC and ATAPI were discussed as reasons for keeping SEEK. It was then noted that REZERO UNIT is used more frequently than SEEK. The working group recommended that the previous plenary actions be replaced with a motion to make the REZERO UNIT and SEARCH DATA XXX commands obsolete and that the technical editor modify the SEEK command description to describe its current uses.

Gene asked that the SBC technical editor be authorized to create SBC revision 7, containing the changes agreed by the working group and the changes agreed by the editing meeting, and that the X3T10 chair be authorized to issue a letter ballot regarding the forwarding of SBC to X3 for further processing toward first public review. In the absence of any objections, the working group so recommended.

### 7.3 SAM-2 [Monia]

Charles Monia presented proposed wording for addition to SAM-2 that defines the usage of "sending" and "returning" as it relates to command standards. The wording was as follows:

"Within this standard and any SCSI command standard, references to 'sending' or 'returning' an item of data refer to the act of invoking the appropriate protocol service to transfer the information.

"For example, the device server sends command status to the initiator by invoking the Send Command Complete protocol service."

The working group agreed to the proposed wording.

### 7.4 Commands required by SCSI-2 and optional in SCSI-3 (96-230r0) [Penokie]

George Penokie presented a proposal whose effect is to allow drivers to determine that a previously mandatory command (that has been made optional in a newer standard) is not implemented in a (newer) device. The committee discussed the effect of the proposal on initiator software and target firmware. George agreed to revise the proposal and return for additional discussion at the next general working group meeting.

### 7.5 Public Review Comments on SPC [Monia & Penokie]

Ralph Weber reported that the ANSI editor has requested that the SPC notes not be numbered. The group disagreed strongly with the ANSI editor's advice. Tom Coughlan reviewed the comments from Digital. All comments were resolved to the satisfaction of Bob Snively, Tom, and the SPC technical editor. A potential comment from IBM regarding the peripheral device mode page was discussed. The group agreed to respond to the potential comment by making the peripheral device mode page obsolete.

Gene Milligan asked that the working group recommend that the plenary authorize the technical editor to produce SPC Revision 11 resolving the Digital public review comments on persistent reservations (whose resolutions were agreed to by the working group), making obsolete the peripheral device mode page, and processing the

ANSI editorial comments; also that the working group recommend that the plenary authorize the chair to forward SPC Revision 11 to X3 for further processing. In the absence of any objections, the working group so recommended to the plenary. Gene noted that receipt of additional comments (beyond the Digital comment already received and the pending IBM comment on the peripheral device mode page) might require the technical editor and X3T10 chair to delay action until the next working group meeting.

## 8. Other Topics

### 8.1 Greater than 8GB Technical Report Review [Lamers/ ???]

John Lohmeyer reported that Dan Colegrove has decided not to work on the technical report. Gene Milligan described the X3T13 technical report covering the same subject relative to ATA, which includes many issues of relevance to SCSI but is not specifically directed toward SCSI. In the absence of any objections, the working group recommended that this project be withdrawn.

### 8.2 IP over SCSI (Reflector Message) [Lamers]

John Lohmeyer described a message posted to the SCSI Reflector. In the message, Ben Elliston describes a way to encapsulate IP in SCSI. Roger Cummings informed the committee that defining the encapsulation is only a tenth of the work required to successfully run IP over any given physical medium. The group discussed other technical aspects of the proposal. Roger agreed to send a message to Ben Elliston informing him of the FC-LE work going on in X3T11.

### 8.3 SCSI roadmap, standards family bibliography, definition of SCSI vs. SCSI-3 [Lamers]

As part of the discussion of the SPI amendment, the group discussed and revised the SCSI roadmap. The most noticeable change in the roadmap was the removal of acronyms from the boxes containing the document names.

Next, John showed a "normalized" roadmap diagram to the working group. He and the group discussed and "normalized" the roadmap. The proper usage of the list of standards in the family bibliography was discussed. The prevalent view was that, once the roadmap is "normalized", the bibliography is needed to name the documents that go unnamed in the roadmap.

The group agreed that the definition of SCSI-3 should be local to the standard in which it appears. For example, in SPI, the definition of SCSI-3 is any device that conforms to SPI. The marketing definition(s) of 'SCSI' was left up to the various trade associations that deal with SCSI.

### 8.4 SPI Clarification of TTD (96-268r0) [Penokie]

George Penokie described a loophole in the SPI definition of the TARGET TRANSFER DISABLE message (TTD) in 96-268r0. Gene proposed that TTD be made obsolete, instead. John noted that SIP is in public review. Eventually, George agreed to publish the problem description and functional restrictions on when TTD messages can be sent on the SCSI Reflector. It was felt that publication on the SCSI Reflector will be sufficient, until editorial changes can be made in SPI-2 (which includes SIP).

### 8.5 DVD Issues with respect to MMC

The group discussed the relationship between DVD (Digital Video Disks) as defined in SFF document 8090 and SCSI device models, and specifically MMC-2. The major areas of concern were the power management model, fault handling, timeouts and soft retries, and asynchronous event notification. The concern was whether features from SFF 8090 should be incorporated in more general SCSI-3 documents, e.g., SPC-2. After discussing each feature area at a relatively high level, the group agreed that all the features have general value and should be included in SPC-2 or other broadly applicable SCSI-3 standards.

### 8.6 High-Availability Profile [Hagerman]

Doug Hagerman announced that a new revision of the profile is available at this meeting. Doug expressed a strong desire to get a thorough review of profile. The group discussed how best to achieve Doug's goal. Editing meetings and general working group review meetings were discussed as part of achieving Doug's goal. HAP will

be included on the next general working group agenda and will be included in the January '97 document editing session (on Friday).

The group discussed problems with the profile (a technical report) making mandatory the contents of informative annexes in SPI. The requirements about buffered write data, a few other technical issues, and several editorial issues also were discussed.

#### 8.7 SCSI-2 Defects [Milligan]

Gene Milligan presented several problems reported against SCSI-2 via ISO (from Japan). Gene and Larry Lamers reviewed the comments one-by-one. Gene asked the working group to decide whether or not to pursue publishing an errata for SCSI-2. Gene and Larry discussed the complexities of preparing an errata, especially for the domestic version of SCSI-2.

Larry asked that the working group recommend to the plenary that an errata be prepared for the ISO version of SCSI-2 and that the domestic version of SCSI-2 be replaced with the ISO version plus the errata. In the absence of any objection, the working group so recommended.

#### 9. Meeting Schedule

The next meeting of SCSI Working Group will be January 7-8, 1997, in Dallas, TX at the Omni Dallas Hotel at Park West (972-869-4300), hosted by Quantum Corp.

#### 10. Adjournment

The meeting was adjourned at 6:30 p.m. on Wednesday November 6, 1996.