Accredited Standards Committee*
X3, Information Processing Systems

Doc. No.: X3T10/94-187r0
Date: Sept 20, 1994
Project:
Ref. Doc.:
Reply to: J. Lohmeyer

To: Membership of X3T10

From: Weber/Lohmeyer

Subject: Minutes of X3T10 SCSI Working Group September 13-14, 1994

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*Operating under the procedures of The American National Standards Institute.
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Results of Meeting

1. Opening Remarks

John Lohmeyer, the Chair, called the meeting to order at 1:00 p.m., September 13, 1994. He thanked Bill Galloway of Compaq Computer for hosting the meeting.

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

It was stated that the meeting had been authorized by X3T10 and would be conducted under the X3 rules. Ad hoc meetings take no final actions, but prepare recommendations for approval by the X3T10 task group. The voting rules for the meeting are those of the parent committee, X3T10. These rules are: one vote per company; and any participating company member may vote.

The minutes of this meeting will be posted to the SCSI BBS and the SCSI Reflector and will be included in the next committee mailing.

2. 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 company to attend and to express their opinion on the subjects being discussed.

The following people attended the meeting:

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          Name            S      Organization        Electronic Mail Address
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Mr. Norm Harris        P  Adaptec, Inc.            nharris@eng.adaptec.com
Mr. Lawrence J. Lamers A# Adaptec, Inc.            ljlamers@aol.com
Mr. Jack Newman        V  Adaptec, Inc.
Mr. Neil T. Wanamaker  P  Amdahl Corp.             ntw20@eng.amdahl.com
Mr. Michael Wingard    A  Amphenol Interconnect
Mr. Ken Scherzinger    V  Amphenol Spectra Strip
Mr. Gary Porter        A  Ancot Corp.              garyp@ancot.com
Mr. Jerry Fredin       V  AT&T Global Info.        Jerry.Fredin@WichitaKS.NC
                          Solutions                R.COM
Mr. John Lohmeyer      P  AT&T/ NCR                john.lohmeyer@ftcollinsco
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Mr. Jason Albanus      P  Burr-Brown Corp.         Albanus_Jason@bbrown.com
Mr. Joe Stoupa         A  Burr-Brown Corp.         Stoupa_Joe@bbrown.com
Mr. Ian Morrell        P  Circuit Assembly Corp.   crctassmbl@aol.com
Mr. Joe Chen           P  Cirrus Logic Inc.        chen@cirrus.com
Mr. Bill Galloway      P  Compaq Computer Corp.    billg@bangate.compaq.com
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Mr. Peter Johansson    P  Congruent Software, Inc. pjohansson@aol.com
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Dr. William Ham        A# Digital Equipment Corp.  ham@subsys.enet.dec.com
Mr. Douglas Hagerman   A# Digital Equipment Corp.  hagerman@starch.enet.dec.
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Williams
Mr. Bill Hutchison     V  Hewlett Packard Co.      hutch@boi.hp.com
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Mr. George Penokie     P  IBM Corp.                gop@rchvmp3.vnet.ibm.com
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Mr. Gary Brandvold     A  Iomega Corp.             gdbrandv@iomega.com
Mr. Dean Wallace       P  Linfinity Micro
Mr. Ron Roberts        P  Maxtor Corp.             rkroberts@aol.com
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                          Corporation
Mr. Duncan Penman      P  Zadian Technologies    penman@netcom.com

58 People Present

Status Key:  P    -  Principal
             A,A# -  Alternate
             O    -  Observer
             L    -  Liaison
             V    -  Visitor
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3.   Approval of Agenda

The proposed agenda was approved.

4.   Physical Topics

4.1 Fast-20 Node Capacitance (94-103r2, -151r0, -163r0) [Novak,Ham,Lamers]

Gene Milligan started by raising questions about the slew rate test circuity. Bill Ham agreed to address those questions during this discussion.

Bill Ham displayed the results of his 20 pF device testing. Bill noted that using 20 pF loads did not recover enough margin to recommend any changes in the configuration specifications.   When questioned, Bill noted that, although the margin improved, it did not improve enough to permit adding more devices or longer cables. Bill showed several oscilloscope traces from his 20 pF testing.

Norm Harris followed with a description of his Fast-20 testing data. A modified chip was used to send data and ACK signals at the Fast-20 rate. Various SCSI peripheral devices were used as loads, but they did not actually receive the data. He noted that his data does not cover the capacitance issues very well. Norm said that the data is preliminary and he promised better data in November.

Three configurations were shown; a 3 meter bus length, 4 bus loads, and a configuration that Norm described as typical of add-in host adapters. The typical configuration had 2 internal drives and 1 external CDROM drive. Norm's data looked encouraging to the working group.

The meeting returned to Gene's test circuit question. The standard says that the slew rate test circuit shall have a capacitance of 15 pF. Is that the total capacitance, or the capacitance external to the driver (in the test circuit)? The working group agreed that 15 pF is the capacitance of the test circuit (external to the driver). The Fast-20 document will be modified to clarify this point.

John Lohmeyer called for a working group statement regarding 20 pF capacitance followed by a vote at the Plenary. Norm Harris moved that the current Fast-20 specification (of 20 pf) be left unchanged. Bill Galloway seconded the motion. Jim McGrath questioned the need for 20 pF, based on the data presented earlier in the meeting. Jim noted the problems with switchable internal terminators in drives. Jim and Bill Galloway offered customer-based reasons for their preferences.   The motion failed 10:13.

Jim McGrath moved that the Fast-20 standard be changed to require 25 pF. Erich Oetting seconded the motion. The motion passed 14:5.

Bill Ham requested that the annex describing the value of lower load capacitance be completed. Kevin

Gingerich said that he has a draft of the annex almost ready.

4.2 Higher Density Connector (94-160) [Whiteman\Lohmeyer]

John Lohmeyer described a perceived need for a higher density connector. John admitted that he had not written the project proposal for the new connector. John promised to get the project proposal written for the next mailing. Bob Whiteman was not present.

Gene Milligan asked if Small Form Factor might already being doing this work. Bill Ham noted that X3T10 work would be preferable to SFF work, provided that X3T10 is truly interested (as gauged by support for the project proposal). Jim McGrath noted that a project proposal must scope the task to general connector characteristics, not specific connector vendor products. Issues regarding the project scope were discussed in detail, providing guidance to John for writing the project proposal.

4.3 3.3-volt SCSI Issues (94-164r1) [Aloisi]

Paul Aloisi presented a discussion of Termpwr in a 3.3 volt SCSI environment. Paul's first point, that a diode drop does not work, generated significant complaints from Bill Ham and Gene Milligan.

Paul recommended a unidirectional circuit breaker. George Penokie read the SPI document to prove that Paul's recommendation is sanctioned by the existing standard. Paul recommended a different SCSI icon for 3.3 volt systems and a T-bar symbol for systems that cannot provide termpwr to the end of the bus. Paul noted that all 3.3 volt systems must use active termination. Paul proposed an informative annex for SPI dealing with laptop SCSI bus termination issues.

Further probing the circuit breaker issue, Gene Milligan asked about Unitrode patents. Paul said that elements of their unidirectional circuit breaker are patented. However, Paul said that he thought that equivalent circuit breakers can be built without infringing Unitrode patents.

Bill Ham said that many other issues arise in a 3.3 volt environment. He expressed a belief that a study group should be started to develop a micro-SCSI (SPI-2) standard. (Note: X3T10 assigned this topic to Tuesday morning of the SCSI-3 Working Group in November.)

4.4 Review of SCAM Annex in SPI Rev 13 [Johansson]

Peter Johansson described how he and Larry tried to make a more readable SCAM document via editorial (wording) changes. Peter answered several questions regarding the revised SCAM document. Peter described some comments that he received in electronic mail.

4.5 Fast-20 Synchronous Negotiation Period Values [Harris]

Norm Harris led a discussion of possible transfer period values for 20 mega-transfers per second: 52, 48, and 44 nanoseconds. After a lengthy discussion, Larry took a straw poll as follows:

	For	Against
1) Transfer Period of 48 => 50	4	12
2) 20.8 mHz instead of 20 mHz	11	7
3) New/redefined message	8	11

Option 1 means that the current SDTR message protocol remains, but a TP of 48 is defined to mean a TP of 50 (which is not truely expressable under the current rules). Option 2 means that the Fast-20 project redefines its maximum transfer rate to be 20.8 mega-transfers per second (as opposed to the current 20 mega-transfers per second). Option 3 is a yet-to-be-defined change in the message protocol

that replaces the current SDTR message. The group recessed for lunch.

After lunch, Norm Harris moved that in a SDTR message a transfer period factor of 12 means a transfer period of 50 nanoseconds. Gene Milligan seconded the motion. The motion passed 18:7.

5. Protocol Topics

5.1 SAM Forwarding Comments Resolution (Project 994D) [Monia]

Charles Monia presented a review of his comments resolution document, 94-173r1. Charles referenced each comment and asked those present (particularly the person who submitted the comment) to review the resolution. Then, Charles reviewed other SAM changes listed toward the end of the 94-173r1 document.

An implementer's note stating a requirement for a mechanism that a driver can use to determine supported options was removed based on negative working group comments. Inclusion of the dual port material generated several questions and comments. At Charles' request, the working group unanimously endorsed 94-173r1 as amended as a proper and complete resolution of the SAM letter ballot comments.

5.1.1   Incorporating Dual Port into SAM (reflector messages) [Monia]

Charles presented document 94-186r0. The issue to be addressed is how BUS DEVICE RESET and BUS DEVICE RESET OTHER PORT function with respect to ACA. While Charles had pushed off much of the dual port discussion during the previous agenda item, the swamp really began to stink here. Jeff Williams noted that dual port definitions affect many (if not most) of the object definitions and other text in the SAM.

Charles agreed to withdraw 94-186r0 from X3T10 discussions until a larger electronic mail discussion provides better direction for the document's contents. Charles also noted that SAM revision 15 contains plenty of the dual port material that needs a better group review.

The working group then discussed the intention of the Plenary (several years ago) when the dual port documents were approved. Did those approved documents apply to SAM? Or, did the Plenary intend that the documents apply to SIP? This issue was not resolved.

5.1.2   Status Precedence (94-171r0 & reflector messages) [Monia]

Charles presented a proposal for precedence ordering among possible SCSI status code values. This immediately was met with, "How does this affect the public review process for SAM?" questions.

Eventually, the working group held a short discussion of the technical issues represented by the proposal. A small editorial change was accepted by Charles. The change had the effect of placing all the status codes named in the proposal on an equal precedence basis. Then, the working group unanimously endorsed the amended 94-171r0 as a proper addition to SAM. However, Charles and the working group agreed to set the proposal aside for SAM-2. The group also felt that a Plenary vote supporting these decisions might be appropriate.

5.1.3   Mandatory vs. Optional Features (94-172r0 & reflector messages) [Monia]

Charles presented a proposal regarding how mandatory and optional features in SAM affect other SCSI-3 standards documents. He received several editorial comments. The working group discussed the purposes of standards, the relationships of standards documents, and the effects of normative

references in a standard. The objective seemed to be developing an understanding of how precedence relationships should be described among the various SCSI-3 standards documents. Various examples were cited, such as: task set management, requirements for abort handling, and status code value definitions.

As the allotted time elapsed, Charles proposed that the discussion continue in electronic mail.

5.1.4   ACA Recovery Methods Supported by a Logical Unit (94-177r0) [Monia]

Charles noted that initiators currently have no mechanism for determining which usages of the CONTROL byte ACA bit are supported by the SCSI device. Charles presented a proposal for added bits in the INQUIRY data to communicate the target's ACA bit support. Bob Snively stated his belief that the zero state of the ACA bit should be mandatory. Jeff Williams stated his support for the current (both ACA bit states optional) situation. The discussion then ranged over all previously mentioned topics, plus the TEST SUPPORT proposal and the error recovery mechanics of serial busses.

A straw poll was taken regarding the acceptability making mandatory device support for ACA equals zero in the CONTROL byte. The straw poll passed 10:4:8. Bob Snively agreed to write the proposal for making ACA=0 mandatory.

This was followed by a continued discussion of how ACA, CA, and failure processing should work in a queuing environment. There was no obvious resolution to the issue.

After an offline discussion, Bob Snively presented a revised proposal. The proposal defines only one new bit, an ACA Autoclear bit in the Standard INQUIRY data. Bob drew several pictures on a blank overhead foil. The discussion probed many details of the proposal. The secretary had great difficulty copying the charts Bob drew to the minutes. Eventually, Bob agreed to draft a document that describes the new proposal (94-189r0).

5.2 SBP Forwarding Comments Resolution (Project 992D) [Lamers/Roberts]

Larry Lamers reported that the forwarding letter ballot comments have been resolved. The resolutions have been published and no one has complained about an unsatisfactory resolution for their comments. Larry anticipated a vote to forward to public review at the Plenary meeting.

5.2.1   Proposed changes to SBP Isochronous Data Handling (94-161) [Smyers]

There was no discussion on this item. Those that care apparently agree with the proposal and it is being incorporated into SBP.

5.3 FCP Forwarding Comments Resolution (Project 993D) [Snively]

Bob Snively reported on changes in directions regarding the Abort Tast, Abort Task Set, Clear Task Set, and Target Reset task management functions. The profiles group and the engineers building FC-AL products have asked for changes in how these functions are defined. The changes place a greater burden on the initiator. No one present raised strongly held objections to either the current FCP statements or the changes.

The major issues were procedural. The best way to get the consensus version of FCP on the Plenary agenda for forwarding to public review was discussed. Larry noted that the plan presented by Bob could be blocked by the two-week rule at the Plenary.

The discussion torpedoed when Jeff Williams suggested that the text in question was introduced as a

response to one of the early letter ballot comments. Bob, Larry, Jeff, and John spent several minutes trying to identify the FCP revision in which the text under discussion were introduced after the FCP revision that accompanied the letter ballot.

(See 7.4 for a continuation of this discussion.)

5.4 Should SIP require an IDENTIFY message? (reflector messages) [Frazier]

Continuing a lengthy electronic mail discussion, Giles Frazier presented his concerns about the SCSI-3 change that reserves the LUN field in the CDB combined with older host software that uses the CDB LUN field and does not send IDENTIFY messages. Gary Stephens noted that the current definitions result from a planned (announced) progression away from SCSI-1 to universal usage of the IDENTIFY message. Gary noted that the initial definition of this change was made (and announced) several years ago.

The working group largely disapproved of the proposal. Comments included; "A bus with a broken attention line will not work, irrespective of LUN handling," "The proposed change breaks all attempts to reclaim the CDB LUN field." In a straw poll, no one favored any changes to any of the applicable current draft standards.

5.5 Request Transfer Parameters message (reflector message) [Porter]

Gary Porter said that he is withdrawing the proposal as he has found a less obtrusive work around.

6.   Command Set Topics

6.1 Reserve & Release in SPC (94-106r2) [Weber]

Ralph Weber presented the latest revision of his proposal for incorporating the RESERVE and RELEASE commands in the SPC and handle 64-bit LUN values. There was little comment on the proposal. Gary Porter moved that 94-106r2 be incorporated in the SPC. Charles Monia seconded the motion. The motion passed 6:0.

After the discussion closed, Gerry Houlder produced a few, mostly editorial, comments. The most significant concened allowed WRITE BUFFER commands in the presence of extent reservations. Gerry noted that WRITE BUFFER now is used mostly for download microcode operations. Gerry felt that microcode loads should be blocked by extent reservations. Jim McGrath and a majority of the working group agreed with Gerry. Ralph agreed to attempt to resolve these issues at the Plenary.

6.2 PORT STATUS Operation Code (94-176r0) [Weber]

Ralph presented a proposal that the PORT STATUS command (from X3T9.2/93-041r2) have its operation code changed from 11h to 1Fh. Ralph noted that 1Fh is the last operation code for a 6-byte CDB. After a short discussion, Erich Oetting moved that the PORT STATUS command operation code changed be from 11h to 1Fh. Ted Lappin seconded the motion. The motion passed 12:0.

6.3 SCSI-3 INQUIRY Command (94-079r1) [McGrath]

Jim McGrath reviewed his proposal for the addition of version compliance data to the INQUIRY command. Jim described the need for compliance data that extends beyond the CDBs (see the agenda discussion for document 94-178r0). There followed a discussion of the possible methods for communicating the version data. Jim was seeking input about how best to revise his proposal.

John Lohmeyer asked for a straw poll about whether the proposal represents a valid direction. Ultimately, several questions were asked and voted on in a straw poll format. Jim asked if SCSI-3 should have any more interconnect data in the Standard INQUIRY data. The straw poll disapproved the question 1:21. Should the mode pages contain interconnect-specific data? The straw poll split on this question 10:9. Some people stated that they felt the right way to include interconnect-specific information is to have separate mode pages for each interconnect.

6.4 Data Recovery on Deferred Errors (94-067r2) [Houlder]

Gerry announced that he was withdrawing the proposal. The meeting broke into a sustained moment of silent pandemonium.

6.5 FORMAT MEDIUM Command for SSC (94-146r3) [Cummings]

Ken presented his revised proposal for applying the FORMAT MEDIUM command to tapes. There was some discussion of the details of the proposal. Erich Oetting moved that the working group recommend addoption of 94-146r3. Ted Lappin seconded the motion. The motion was approved 17:0.

6.6 Enhanced READ BUFFER command (94-128) [Lappin]

Ted offered to withdraw his proposal. His offer met with no opposition.

6.7 Enhanced Partition Mode Pages for SSC (94-152r0) [Lappin]

Ted presented a proposal for modifying the tape partitioning mode pages based on his own insights and the recent SCSI-2 Sequential-access TIB. Ted described the specifics of his proposal in detail. A straw poll favored the proposal 7:0.

6.8 SCSI Queuing Data Integrity Problem? (reflector messages) [Sprenkle]

In the absence of Todd Sprenkle, Larry asked if anyone present thought the problem represented a real issue. Bob Snively said that he thought the issue was indeed serious. A reading of the electronic mail showed that the problem was a SCSI-2 issue. George Penokie said that ACA solves the problem in SCSI-3. The group then discussed several ways to resolve the problem in SCSI-2. No action was necessary or taken.

6.9 QErr bit and Multi-Initiator (reflector messages) [Binford]

In the absence of Charles Binford, George described the problem as being a desire to remove one initiator's queue entries after a CHECK CONDITION without removing all queued entries. George said that the problem is solved by ACA.

6.10   TB, DTE, and PER bit interaction (reflector messages) [McGrath]

Jim McGrath noted that he was satisfied with the comments that he had received in electronic mail. Jim felt that no further discussion was necessary. However, Jim may make a proposal to the block commands editor.

6.11   SPC Rev. 2 review [Weber]

Ralph Weber conducted a short review of the SPC revision 2. Gene Milligan noted that log page code 8 is missing from table 60. There were no other comments.

6.12   Proposal for TEST SUPPORT command (94-178) [Weber]

Ralph Weber presented proposal that gives the initiator a way to determine what CDBs are supported and how fields within those CDBs and their parameter data are evaluated by the target. The target memory requirements resulting from the proposal were discussed. The working group strongly suggested that parameter data be dropped from the proposal. Doing that will reduce the memory requirements. Also, even Ralph was not sure that the more complex parameter lists can be properly described by the bit mask format response data defined in the proposal.

Gene Milligan questioned what action is required from a target when the tested operation code is one that it does not support. Ralph described his intentions. Gene suggested that such information should appear in the proposal.

John Lohmeyer suggested that the ECMA version field be changed to reserved since ECMA withdrew their SCSI standard, and that the ISO version and ANSI-approved version fields be expanded. Ed Gardner objected on the grounds that SCSI-8 was a concept too horrible to allow. Ralph agreed to change the ECMA version field to reserved.

A series of straw polls were taken. "Should this capability exist in the SCSI-3 standard?" was approved 12:6. "Should this capability be mandatory for all SCSI devices?" was disapproved 3:13. "Should this capability be part of the INQUIRY command (not a separate command)?" was approved 11:8.

Ralph agreed to draft a new document describing the capability as a sub-function of the INQUIRY command and incorporating most of the other suggestions made by the working group.

7.   Other Topics

7.1 Japanese Comments on CD 9316-1 (SCSI-2) [Lamers]

Larry Lamers described comments received from Japanese reviewers of the SCSI-2 standard. The comments can be found in document 94-143. Larry and John expected that most of the comments would be accepted as editorial. Some of the comments concerned rounding of metric conversions on dimensions in the connector drawings. John Lohmeyer said most of these comments have been incorporated in revision 13 of SPI.

7.2 TIB on SCSI-2 Logging Operations (94-168r0) [Penokie]

George Penokie stated that no changes had been made on the Logging Operations TIB. Gene Milligan made a few specific comments about needed corrections in the current TIB.

7.3 TIB on SCSI-2 Sequential Access Partition Management (94-169r0) [Stephens]

John Lohmeyer described the forwarding process for a TIB. He asked Ted Lappin if he was comfortable with forwarding the TIB at the Thursday Plenary. Jim McGrath proposed using a letter ballot, to encourage a wider reading of the document.

7.4 FCP Again [Milligan]

Gene Milligan presented proposed wording for a note to be added to FCP. The note attempts to warn readers about pending changes resulting from work on the FCP during the comments resolution process. The working group unanimously recommended addition of the following text to clause 7.1.2.2:

Note: X3T10 plans to consider recommendations from industry groups and other contributors

resulting from early implementations and evaluation of FCP (e.g. a definition of the Abort Task Set, Clear Task Set, and Target Reset functions, in FCP, which may eliminated associated recovery abort functions generated by the target) is a future version of FCP.

8. Meeting Schedule

The next working group meetings will be the week of November 7-11, 1994 at the Hyatt Regency Suites (619-322-9000) in Palm Springs, CA hosted by Western Digital. The room rates are $105.00 (includes tax and parking). The reservation deadline for these rates is October 17, 1994. The group name is Western Digital. The host contact is Jeff Stai at: 714-932-7644, FAX: 714-932-6496, or EMAIL: stai@dt.wdc.com.

9. Adjournment

The meeting was adjourned at 6:30 p.m. on Wednesday September 14, 1994.