Accredited Standards Committee*
X3, Information Technology

To: Membership of X3T10

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

Subject: Minutes of X3T10 SCSI Working Group Meeting
              Colorado Springs, CO -- July 16-17, 1996

_____

Agenda

1. Opening Remarks

2. Approval of Agenda

3. Attendance and Membership

4. Physical Topics
      4.1 Review of SPI Amendment (SPI Amnd) [Lamers/Johansson]
      4.2 Arbitration Fairness (96-172) [Lohmeyer]
      4.3 Document Strategy

5. Protocol Topics
      5.1 Problem with Non-interlocked Busses (96-173r0) [Monia]
      5.2 New Task Management Models for SAM (96-198r0) [Johansson]
      5.3 SAM-2 Changes & Layered Architecture (96-191r0) [Monia]
      5.4 Tape Support on FC-AL (Reflector Messages) [Hagerman]
      5.5 SBP-2 Rev 1 Review [Johansson]

6. Command Set Topics
      6.1 Resolution of the SCSI-3 Primary Commands (SPC) Forwarding Comments [Weber]
          6.1.1 Test Unit Ready and Deferred Error Reporting (96-182) [Stephens]
          6.1.2 Add Mode Page for fibre channel features (96-195) [Houlder]
          6.1.3 Request for Firmware Boot/Restart ASC/ASCQ (96-192r0) [Monia]
      6.2 Review of SCSI-3 Enclosure Services (SES) [Snively]
      6.3 Clarification of sleep mode (96-140) [Penokie]
      6.4 SCSI-3 Block Commands (SBC) Review [Milligan]
          6.4.1 Should READ(6), RESERVE(6), and RELEASE(6) be mandatory? (96-183) [Stephens]
          6.4.2 Security Initialization Proposal for SBC (96-186) [Weber/Lohmeyer]
          6.4.3 Additional XOR bit (96-194) [Houlder]
      6.5 SIP Public Review Comments [Penokie]

7. Other Topics
      7.1 Greater than 8GB Technical Report Review [Lamers/Penman]
      7.2 High Availability SCSI Profile (96-151r1) [Hagerman]
      7.3 SCSI-2 Questions (96-212) [Monia]

8. Meeting Schedule

_____

<div align="center">Results of Meeting</div>

1.   Opening Remarks

John Lohmeyer, the X3T10 Chair, called the meeting to order at 9:00 a.m., Tuesday July 16, 1996. He thanked Symbios Logic 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:

> 6.1.3 Request for Firmware Boot/Restart ASC/ASCQ (96-192r0) [Monia]
> 6.5 SIP Public Review Comments [Penokie]
> 7.3 SCSI-2 Questions (96-212) [Monia]

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.           ljlamers@aol.com
Mr. Charles Brill        P  AMP, Inc.               cebrill@amp.com
Mr. Jan V. Dedek         P  Ancot Corp.             dedek@ancot.com
Mr. Ron Roberts          A  Apple Computer          rkroberts@aol.com
Mr. Jim Koser            O  BERG Electronics        jkoser@aol.com
Mr. Douglas Wagner       O  Berg Electronics        jpxw76a@prodigy.com
Mr. Bill Galloway        O  Compaq Computer Corp.   billg@bangate.compaq.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. William Dallas       A# Digital Equipment Corp. dallas@wasted.enet.dec.com
Mr. Roger Cummings       P  Distributed Processing  cummings_roger@dpt.com
                            Tech.
Mr. Edward Lappin        P  Exabyte Corp.           tedl@exabyte.com
Mr. Gary R. Stephens     P  FSI Consulting Services 6363897@mcimail.com
Mr. Andy Chen            A  Fujitsu Computer Prods  achen@fcpa.fujitsu.com
                            Amer
Mr. William Martin       A# Hewlett Packard Co.     wrm@core.rose.hp.com
Mr. Zane Daggett         P  Hitachi Cable           zdaggett@hcm.hitachi.com
                            Manchester,Inc
Mr. George Penokie       P  IBM Corp.               gop@rchvmp3.vnet.ibm.com
Mr. Robert Basham        O  IBM Corp.               mabrewer@vnet.ibm.com
Mr. Giles Frazier        V  IBM Corp.               gfrazier@ausvm6.vnet.ibm.
                                                    com
Mr. Dean Wallace         P  Linfinity Micro         75671.3443@compuserve.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. Edward A. Gardner    P  Ophidian Designs          gardner@acm.org
Mr. Skip Jones           P  QLogic Corp.              sk_jones@qlc.com
Mr. Mark Evans           A  Quantum Corp.             mevans@qntm.com
Mr. Gene Milligan        P  Seagate Technology        Gene_Milligan@notes.
                                                      seagate.com
Mr. Gerald Houlder       A  Seagate Technology        Gerry_Houlder@notes.
                                                      seagate.com
Mr. Dave Guss            P  Silicon Systems, Inc.     dave.guss@tus.ssi1.com
Mr. Erich Oetting        P  Storage Technology Corp.  Erich_Oetting@Stortek.com
Mr. Robert N. Snively    P  Sun Microsystems Computer bob.snively@eng.sun.com
                            Co
Mr. John Lohmeyer        P  Symbios Logic Inc.        john.lohmeyer@symbios.com
Mr. Rod DeKoning         A  Symbios Logic Inc.        rod.dekoning@symbios.com
Mr. Ralph O. Weber       A# Symbios Logic Inc.        roweber@acm.org
Mr. Akram Atallah        A  SyQuest Technology, Inc.  akram.atallah@syquest.com
Mr. Arlan P. Stone       A  UNISYS Corporation        arlan.stone@mv.unisys.com
Mr. Paul D. Aloisi       P  Unitrode Integrated       Aloisi@uicc.com
                            Circuits
Mr. Jeffrey L.           P  Western Digital           jwilliam@wdroc.wdc.com
Williams                    Corporation

39 People Present

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

4.   Physical Topics

4.1   Review of SPI Amendment (SPI Amnd) [Lamers/Johansson]

Larry Lamers reported that work on the ISO version of SPI is progressing. The ANSI editorial changes have been incorporated. The SPI amendment and ISO comments will be incorporated. It is expected that a draft with these changes will be in the next mailing.

4.2   Arbitration Fairness (96-172) [Lohmeyer]

John Lohmeyer reviewed the proposal from yesteryear on arbitration fairness. The working group recommend that arbitration fairness be included in a future document (EPI, SPI-2, SUPR, ???). There exist three fairness bits in the Disconnect Reconnect Page should be used to control what phases use the fairness algorithm.

4.3   Document Strategy

John reported on the history of the debate about the contents of the SPI-2 document. John focused on events that occurred during the last two months. George Penokie and Gary Stephens objected to the change in direction away from folding all the parallel definitions into SPI-2. The group discussed the SPI-2 documentation strategy.

5.   Protocol Topics

5.1   Problem with Non-interlocked Busses (96-173r0) [Monia]

Ed Gardner reported on the Serial Issues meeting (see the minutes in 96-204). The six-byte RESERVE and RELEASE commands should be declared obsolete and the ten-byte made mandatory. Ed noted that there was a lot of discussion on ordered delivery and device identification. An extension to the current device identification in SPC is expected.

On the second meeting day, Rod DeKoning presented a draft proposal for changing the device identification VPD page. The proposal adds a logical unit / port flag bit to the identification descriptor.

5.2   New Task Management Models for SAM (96-198r0) [Johansson]

Peter Johansson presented a proposal with the details for the new task models, basic, enhanced, and full.

Bob Snively suggested that the basic task model should not have the ordered tag. Larry Lamers noted that existing software uses the ABORT TASK. Sense information and contingent allegiance handling need further clarification.

The group decided to rename enhanced to basic. The group set the basic requirements to SIMPLE tags only, no untagged commands. In basic mode, the ABORT TASK, ABORT TASK SET, and TARGET RESET management functions must be supported. Also, in the basic mode the task set is cleared on CHECK CONDITION status.

Bill Galloway suggested that the basic queuing model support be reported in INQUIRY data.

Peter agreed to revise his proposal per the working group's direction.

5.3   SAM-2 Changes & Layered Architecture (96-191r0) [Monia]

Charles Monia stated issues regarding current working drafts and dpANS.
        a) Relationships between SAM and other standards are not clear.
        b) Ground rules for SAM compliance are undefined.

He suggested the use of OSI methods to refine the committee's draft standards format. He proposed that the committee define compliance in terms of a uniform SCSI service model and protocol.

5.4   Tape Support on FC-AL (Reflector Messages) [Hagerman]

Discussion of this topic was deferred to the September meeting since Doug was not able to attend.

5.5   SBP-2 Rev 1 Review [Johansson]

Peter Johansson described the history, to date, of SBP-2. He explained that problems with SBP have prevented its adoption as a disk attachment interface. Peter noted that the current SBP-2 is somewhat controversial within the group the developed the revision 1 draft. The nature of the controversy was discussed.

Peter then described the design goals and key enhancements for SBP-2. Peter provided an overview of major operational features of SBP-2. The working group discussed Peter's presentation. Several concerns were raised. Peter agreed to take the group's concerns into consideration during future development work on SBP-2.

6.   Command Set Topics

6.1   Resolution of the SCSI-3 Primary Commands (SPC) Forwarding Comments [Weber]

The group discussed the notes produced by the several SPC editing meetings. All issues raised by the editing meetings were resolved to the satisfaction of the working group. In the absence of any objections, the working group recommended that the plenary accept the resolutions to the letter ballot comments on SPC (96-148r3), approve SPC revision 9b as resolving the letter ballot comments, and approve SPC revision 10 (revision 9b as modified by the working group) for further processing toward first public review.

6.1.1   Test Unit Ready and Deferred Error Reporting (96-182) [Stephens]

The working group resolved the issues raised by the Test Unit Ready and Deferred Error Reporting proposal as part of the SPC forwarding comments review.

6.1.2   Add Mode Page for fibre channel features (96-195) [Houlder]

Gerry Houlder presented a proposal to add a mode page for controlling FC-AL features. The working group discussed the proposal at length. Gerry was convinced that the issue should be deferred until X3T11 reaches consensus regarding the underlying features referenced in the proposal.

6.1.3   Request for Firmware Boot/Restart ASC/ASCQ (96-192r0) [Monia]

Charles presented a request for assignment of a new ASCQ in the ASC 29 group to identify Firmware Boot/Restart condition. The group recommended that the plenary approve the assignment of ASC/ASCQ 29/04 to DEVICE INTERNAL RESET.

6.2   Review of SCSI-3 Enclosure Services (SES) [Snively]

Bob Snively reviewed the technical changes that produced revision 6 of SES. The topic of multi-initiator support was discussed at length. Bob described his plans to hold a letter ballot for forwarding the SES revision to first public review.

Possible patent problems with implementing SES were discussed. Concerns were raised about publicizing the fact that SES is replacing SAF-TE. Bob agreed to work with Roger Cummings and others to publicize the SES status.

6.3   Clarification of sleep mode (96-140) [Penokie]

George Penokie presented the revision of the sleep mode proposal (96-140r3) produced in response to the comments made at the last working group meeting. While presenting the power conditions flow model, George noted that a state transition available in ATA is not available in SCSI. SCSI does allow automatic transitions directly from Active to Standby, Active must transition to Idle first. Larry Lamers suggested that this limitation be documented in a note.

Several questions were raised about the new SAM-2 task management functions. Most of the questions concerned wordsmithing issues. George agreed to make minor changes. Several semantic questions were discussed during the review of the part of the proposal affecting SIP. Again, George agreed to make minor changes.

George asked that working group approve the proposal, as modified, for inclusion in SBC, SAM-2, SIP. The request was discussed, but no resolution was reached. The working group recommended that the plenary consider the proposal.

6.4   SCSI-3 Block Commands (SBC) Review [Milligan]

Gene Milligan reported that SBC recently completed professional editorial work to convert the table structure to modern word processor format. He then described the planned future work on SBC. Gene recommended that revision 4 be stabilized with the sleep mode clarification listed as an approved addition.

6.4.1   Should READ(6), RESERVE(6), and RELEASE(6) be mandatory? (96-183) [Stephens]

Larry Lamers reported that the Serial Issues Study Group recommended making RESERVE(6) and RELEASE(6) optional. Giles Frazier proposed that the six-byte commands be left mandatory but the third-party feature be made obsolete. There was a debate over the choice between the two proposals.

A series of straw votes were taken. Regarding the third-party feature in the six-byte commands: leave mandatory 1, make obsolete 16. Regarding checking of the obsolete feature: check 17, do not check 2. Regarding the six-byte commands: leave mandatory 4, make optional 9, make obsolete 6. A follow-up poll was taken eliminating the mandatory choice regarding the six-byte commands: make optional 10, make obsolete 6.

The group then turned to the issue of READ(6). It was noted that WRITE(6) already is optional because some devices do not support writing. Bob Snively moved that READ(6) and WRITE(6) be made obsolete. Larry

Lamers seconded the motion. The motion failed 3:7. Gary Stephens moved that READ(6) be made optional. Gene Milligan seconded the motion. The motion passed 6:3.

6.4.2   Security Initialization Proposal for SBC (96-186) [Weber/Lohmeyer]

John Lohmeyer presented the proposal that resulted from the working group discussion of erasing disks in government installations held during the March Working Group meeting. Questions were raised regarding whether the proposal covers just user data. It was agreed that proposal covers only user data. However, user data that might be hiding in reassigned blocks definitely is covered by the proposal. A minor editorial change was made as a result of the discussion. In the absence of any objections, the working group recommended that the security initialization proposal be accepted by the plenary for inclusion in SBC.

6.4.3   Additional XOR bit (96-194) [Houlder]

Gerry Houlder presented a proposal for improving the performance of some cases handled by the recently approved XOR commands. Questions were asked about the specific operation of the proposed enhancements. These led to a discussion about possible data integrity problems that could result from using the proposed new feature. The group proposed other methods to achieve the same results. Gerry agreed to communicate the group's suggestions to the originator of the proposal. Gerry then agreed to withdraw the proposal.

6.5   SIP Public Review Comments [Penokie]

George reported that the public review comment has been resolved and incorporated in SIP. However, there are other technical issues delaying further processing of SIP.

7.   Other Topics

7.1   Greater than 8GB Technical Report Review [Lamers/Penman]

Larry reported that a draft of the 8GB TR was in the last mailing. Larry stated that the TR needs serious editorial review. Larry suggested that, as an alternative, the TR project might be withdrawn. Larry stated the belief that withdrawal would be acceptable to Duncan Penman.

7.2   High Availability SCSI Profile (96-151r1) [Hagerman]

Discussion of this topic was deferred to the September meeting since Doug was not able to attend.

7.3   SCSI-2 Questions (96-212) [Monia]

Charles presented a collection of assorted questions about SCSI-2. The working group discussed the questions and provided answers.

8.   Meeting Schedule

John reviewed the proposed meeting week schedule for September 1996. The next meeting of X3T10 SCSI Working Group will be September 10-11, 1996, in Natick, MA at the Crowne Plaza Hotel (508-653-8800), hosted by Digital Equipment Corp.

9.   Adjournment

The meeting was adjourned at 5:16 p.m. on Wednesday July 17, 1996.