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
            Ft. Lauderdale, FL -- May 7-8, 1996

_____

Agenda

1. Opening Remarks

2. Approval of Agenda

3. Attendance and Membership

4. Physical Topics
    4.1 SPI Amendment (96-130) [Johansson]
    4.2 SPI-2 Hot Plugging [Ham]
    4.3 Arbitration Fairness [Lohmeyer]
    4.4 SPI-2 Document Strategy
    4.5 Clarification of When Parity Is Valid (96-162r0) [Penokie]

5. Protocol Topics
    5.1 Problem with Non-interlocked Busses (96-173r0) [Monia]
    5.2 SIP and Command Queuing (96-112r0) [McGrath]
        5.2.1 SAM and Task Management (96-170r0) [Johansson]
    5.3 SAM-2 Changes (96-169r0) [Monia]
    5.4 Tape Support on FC-AL (Reflector Messages) [Hagerman]

6. Command Set Topics
    6.1 Resolution of the SCSI-3 Primary Commands (SPC) Forwarding Comments [Weber]
    6.2 Review of SCSI-3 Enclosure Services (SES) [Snively]
    6.3 Clarification of sleep mode (96-141r1) [Penokie]
    6.4 Programmable Capacity Revisited (96-171r0) [Houlder]
    6.5 SCSI-3 Block Commands (SBC) Review [Milligan]
    6.6 SCC-2 Discussion [Penokie]
    6.7 Security Erase [Schultz/Lohmeyer]
    6.8 MMC-2 and/or Additional CD-ROM Command Set Project (X3T13/96-009) [Milligan]
    6.9 Additional XOR bit [Milligan, Reflector]

7. Other Topics
    7.1 Greater than 8GB Technical Report [Penman]
    7.2 High Availability SCSI Profile (96-151r1) [Hagerman]
    7.3 STA Liaison [McGrath]
    7.4 Normative References

8. Meeting Schedule

9. Adjournment

_____

Results of Meeting

1.   Opening Remarks

John Lohmeyer, the X3T10 Chair, called the meeting to order at 9:05 a.m., Tuesday May 7, 1996 and 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:

        4.2 SPI-2 Hot Plugging [Ham]
        4.3 Arbitration Fairness [Lohmeyer]
        4.4 SPI-2 Document Strategy
        4.5 Clarification of When Parity Is Valid [Penokie]
        5.2.1 SAM and Task Management [Johansson]
        6.9 Additional XOR bit [Milligan, Reflector]
        7.3 STA Liaison [McGrath]
        7.4 Normative References

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. Tak Asami           A# Adaptec, Inc.             asami@itc.adaptec.com
Mr. Edward Fong         P  Amdahl Corp.              esf10@amail.amdahl.com
Mr. George Preputnick   V  AMP, Inc.                 gpreputn@amp.com
Mr. Borden Moller       V  CMD Technology            borden@cmd.com
Mr. Peter Johansson     P  Congruent Software, Inc.  pjohansson@aol.com
Mr. Charles Monia       P  Digital Equipment Corp.   monia@shr.dec.com
Mr. William Dallas      A# Digital Equipment Corp.   dallas@wasted.enet.dec.co
                                                     m
Mr. Douglas Hagerman    A# Digital Equipment Corp.   hagerman@starch.enet.dec.
                                                     com
Mr. Ralph O. Weber      P  ENDL Associate            roweber@acm.org
Mr. Edward Lappin       P  Exabyte Corp.             tedl@exabyte.com
Mr. Gary R. Stephens    P  FSI Consulting Services   6363897@mcimail.com
Mr. Stephen Holmstead   P  Hewlett Packard Co.       stephen@mail.boi.hp.com
Mr. George Penokie      P  IBM Corp.                 gop@rchvmp3.vnet.ibm.com
Mr. Dennis Moore        P  KnowledgeTek, Inc.        dmoore@netcom.com
Mr. Robert Bellino      A# 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. James McGrath	P	Quantum Corp.	JMCGRATH@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. Robert N. Snively	P	Sun Microsystems Computer Co	bob.snively@eng.sun.com
Mr. John Lohmeyer	P	Symbios Logic Inc.	john.lohmeyer@symbios.com
Mr. Rod DeKoning	A	Symbios Logic Inc.	rod.dekoning@symbios.com
Mr. Pete Tobias	A	Tandem Computers	tobias_pete@tandem.com
Mr. Kenneth J. Hallam	P	UNISYS Corporation	ken.hallam@mv.unisys.com
Mr. Paul D. Aloisi	P	Unitrode Integrated Circuits	Aloisi@uicc.com
Mr. Douglas C. Doskocil	V	Wolf, Greenfield, and Sacks	ddoskocil@wgslaw.com
Mr. Tom Sullivan	V	Wolf, Greenfield, and Sacks	

32 People Present

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

4.   Physical Topics

4.1   SPI Amendment (96-130) [Johansson]

John described the sequence of events by which ANSI has "thrown" SPI into a limited public review covering just the figures that changed as a result of the drafting standards change (see the minutes from the March Plenary meeting, X3T10/96-139). He noted that the additional public review will delay publication of SPI without offering X3T10 the opportunity to correct the other known errors.

There was a brief discussion regarding how best to proceed with processing the amendment. It was decided to attempt to take formal action on the amendment following this month's plenary meeting.

4.2   SPI-2 Hot Plugging [Ham]

John reported that Bill Ham has determined that SPI-2, LVD cannot support hot plugging case 4 (changes in configuration without first suspending I/O traffic on the bus). Since this issue was discussed during the SPI-2 Working Group meeting, there was very little discussion of John's report.

4.3   Arbitration Fairness [Lohmeyer]

John introduced the problem of arbitration fairness in configurations with large numbers of drives on a single parallel bus. Low priority drives get starved for bus access. John described an IBM technical report on fairness that George Penokie later turned into a X3T9.2 proposal (89-061r0). Questions were raised regarding whether IBM patented the algorithm described in their technical report. George agreed to determine whether the algorithm was patented. The following day, George reported that the IBM fairness algorithm had been published rather than patented. Larry agreed to redistribute 89-061r0 as 96-172r0 in mailing #3.

John summed up by say that in large configurations, such as those envisioned in EPI, a fairness algorithm will be necessary. Jim McGrath requested a description of the requirements of a fairness algorithm. He suggested that some of the existing Disconnect Reconnect Mode Page controls might be used to produce fairness. After some discussion, it became evident that Jim's requirements were for an isochronous data transfer mechanism, which may need an entirely separate mechanism.

4.4   SPI-2 Document Strategy

John described the original proposal to have SPI-2 supersede all previous parallel physical definitions: SPI, Fast-20, etc. He then described the proposed change to having SPI-2 contain only new work. Gene Milligan requested a detailed outline of the planned contents of SPI-2 (as envisioned today). He was concerned about how the known warts in SPI can be dealt with. John explained the process by which he believes the SPI document can be corrected, including working a corrected SPI through ISO.

John, Larry, and Skip Jones discussed the pros and cons of folding all previous parallel physical topics into SPI-2. Gene repeatedly brought the group back to the question of whether SPI-2 requires SCAM. He noted that the SCA connector (the only internal connector described in SPI-2) does not require SCAM.

Paul Aloisi produced the following list of SPI-2 contents:

    An Incremental Document to SCSI-3 SPI & Fast-20
    Defines new Speeds Fast-40 & Fast-80
    Defines LVD SCSI Interface
    Defines Universal Interface (SE/LVD)
    Defines Universal Terminator
    Defines Termpwr Distribution - 5 Volt & 3.3 Volt
    Defines HVD (EIA485) SCSI Termination

    Undecided Issues
    - Hot Plugging Case 4 doesn't work on LVD SCSI
    - Is SCAM required?

The issue was deferred to the plenary meeting (where it was decided to return to the original proposal of SPI-2 replacing all previous documents).

4.5   Clarification of When Parity Is Valid (96-162r0) [Penokie]

George Penokie presented very simple change proposal to add the words, "at the receiver" to a description of the parity signals in SPI. In the absence of any objections, the working group recommended that the plenary adopt the document for inclusion in SPI-2.

5.   Protocol Topics

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

Charles presented a proposal that extends the actions of ACA to the following statuses QUEUE FULL, ACA ACTIVE, BUSY, RESERVATION CONFLICT. The group discussed the proposal, examined other options, and delved into a wide range of issues involving serial busses.

Eventually, the group decided that a dedicated meeting would be necessary to discuss all the serial bus issues. This was followed by a lengthy discussion of how to provide pre-meeting input to enhance the efficiency of the meeting. The group agreed to request meeting time on Monday afternoon of the July X3T10 meeting week.

5.2   SIP and Command Queuing (96-112r0) [McGrath]

Jim McGrath reviewed a previous proposal that provisions be made for simplified queuing.

5.2.1   SAM and Task Management (96-170r0) [Johansson]

Peter Johansson presented a specific list of changes needed in the SCSI documents to define the simplified queuing described by Jim McGrath (96-170r0). The proposal was discussed at length. Jim McGrath asked for a straw poll to endorse the concepts enumerated in the proposal. The straw poll passed 17:1.

5.3   SAM-2 Changes (96-169r0) [Monia]

Charles Monia presented a list of proposed SAM-2 changes from SAM and new material to be included in SAM-2. Peter Johansson provided some additional advice on changes to Charles. Otherwise, there was minimal comment on Charles' proposal.

The review of SAM-2 proposals was followed by a lengthy discussion of how SAM fits into the larger SCSI conceptual framework. Charles started the discussion by noting that several people have expressed concerns about the difficulty of reading SAM and the notion that reading SAM is not necessary.

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

Doug Hagerman requested that SCSI and Fibre Channel experts attend the SSC Working Group meeting on Thursday at 10 am to discuss Fibre Channel problems with support for tapes.

6.   Command Set Topics

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

The group discussed the substantial editing already performed on the SPC and the need for more SPC review and editing meetings. Meetings were scheduled for the Fridays of the May and July plenary weeks.

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

The discussion opened with a comparison of SES and SCC (SCSI-3 Controller Commands) features. Larry Lamers was concerned that the two command sets provide substantially overlapping features. Bob Snively and George Penokie were able to satisfy Larry that some inconsequential overlap exists but that the overlap is not as large as Larry had feared. Larry asked that SES and SCC-2 clearly describe where the two command sets do and do not overlap.

Rod DeKoning presented a request for extensions to support multiple sub-enclosures. Discussion of the sub-enclosures data formats produced a lengthy debate on the subject of unique IDs. The results of the unique ID discussion was that no changes are needed in Rod's proposal, however, some changes may be needed in the SPC. The specifics of the needed SPC changes involved making some currently optional features mandatory, but the details were never clearly specified during the discussion.

Doug Hagerman objected to the flat addressing scheme in Rod's proposal. He felt that the hierarchical LUN addressing scheme should be used. The group discussed the objection at length. Bob agreed to add strong recommendations favoring the hierarchical addressing over the flat addressing scheme. In addition, he agreed to add the flat addressing scheme in an annex.

George Penokie presented a request for minor changes in the device element status entry resulting from SSA needs. After a brief discussion, Bob accepted the proposed changes with minor revisions.

6.3   Clarification of sleep mode (96-141r1) [Penokie]

George reviewed the details of his proposal for clarification of the START STOP UNIT command in SBC. He described the need for the clarification as coming from the separation of START STOP UNIT (in SBC) and the Power Management Mode Page (in SPC).

In the review of the changes, the group discovered possible problems with the SIP mapping of the TARGET RESET task management function. This produced a lengthy discussion about how the problem should be resolved.

After much discussion, George agreed to revise his proposal to include changes in SAM-2 adding a reset function that affects all targets on an interconnect and adding a new task management function for wake-up from sleep mode. George noted that he will not propose adding a set power level task management function to SAM-2. The group had discussed the set power level function, but George felt unqualified to represent the discussion properly in a written proposal.

Bob reported on a meeting regarding ATAPI sleep. He described a request that the ATAPI sleep state table be imported into SCSI. He stated his plans to review the ATAPI state table in comparison to equivalent SCSI information and bring the results to the working group. Pete McLean was asked to offer a judgment regarding the compatibility of the two sleep models. He felt that they are similar, but the names have been changed to protect the innocent.

Larry and Pete agreed to work with George Penokie to determine how best to incorporate the ATAPI table in SCSI. Later, George presented the revised ATA power management figure showing how SCSI and ATA are very similar in their power management schemes.

6.4   Programmable Capacity Revisited (96-171r0) [Houlder]

Gerry Houlder presented a proposal to correct the usage of the Mode Page header to set the largest logical block address available on a disk (96-171r0). The previously defined usage of zero caused serious problems for existing software. Gerry described the changes to the definition of the zero value behavior and the addition of FFFFFFFFh as a mechanism for requesting the disk to reset to its largest available capacity.

In the absence of any objections, the working group recommended that the plenary adopt the proposal for inclusion in SPC.

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

Gene presented revision 4 of SBC. Numerous details of SBC were discussed and Gene received substantial advice regarding needed changes. Six commands, (such as SEEK and REZERO UNIT) were defined to be obsolete.

6.6   SCC-2 Discussion [Penokie]

John described a project proposal for SCC-2 to be voted on at the upcoming plenary meeting.

6.7   Security Erase [Schultz/Lohmeyer]

John reviewed the security erase proposal. It was obvious that the proposal had not been developed in a sufficiently formal manner. John and Ralph agreed to prepare a formal proposal (see 96-186r0).

6.8   MMC-2 and/or Additional CD-ROM Command Set Project (X3T13/96-009) [Milligan]

Gene Milligan reported that X3T13 will develop an informal reporting mechanism for listing command sets that are developed by other organizations. He described the mechanism as being similar to the vendor ID list maintained by X3T10. He noted that the list will cover as many command sets as become known to X3T13.

6.9   Additional XOR bit [Milligan, Reflector]

Gene reported on a question about the XOR commands. The question was received from the SCSI Reflector. The group discussed the question briefly and Gerry Houlder was volunteered to write a proposal based on the Reflector and Working Group discussion.

7.   Other Topics

7.1   Greater than 8GB Technical Report [Penman]

Larry reported that the 8 GB Technical Report has been edited into the correct format. He believes that the Technical Report should be processed for forwarding using a letter ballot. The reformatted Technical Report will be in the next mailing.

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

Doug reminded the group that the plenary will be asked to forward a project proposal for a high availability technical report. He then presented a review of the topics that he envisioned being covered in the technical report. Doug received advice regarding several items in his topics presentation.

7.3 STA Liaison [McGrath]

The relationship between the technical committee the trade association was discussed. The need for bi-directional communications between the two committees was discussed, with some specific examples of the benefits. Timing issues for the joint meeting were considered.

After some discussion, the group decided to hold a separate STA - X3T10 Liaison meeting to begin at 5 pm on Wednesday of the meeting week.

7.4 Normative References

John and George reported on problems with normative references lists in SCC. The group discussed the required actions to fix the normative references in SCC. General procedures for handling normative references also were discussed. (See the plenary minutes, 96-168, item 8.15 for more information.)

8. Meeting Schedule

John reviewed the proposed meeting week schedule for July 1996. The next meeting of X3T10 SCSI Working Group will be July 16-17, 1996, in Colorado Springs, CO at the Red Lion Hotel (719-576-8900), hosted by Symbios Logic.

9. Adjournment

The meeting was adjourned at 5:30 p.m. on Wednesday May 8, 1996.