Accredited Standards Committee*
**X3, Information Processing Systems**

To:     Membership of X3T9.2

From:   Lamers/Lohmeyer

Subject:    Minutes of X3T9.2 Working Group Meeting March 16-17, 1993

<div align="center">

**Agenda**
</div>

1.  Opening Remarks
2.  Attendance and Membership
3.  Approval of Agenda
4.  SCSI-3 Parallel Inteface (SPI)
    4.1 Report on Colo Sprgs Editing Session (855D r11) [Lamers]
    4.2 Review of SPI revision 11 (X3T9.2/855D) [Lamers]
    4.3 Power Connector Pin & Cavity () [Dambach]
    4.4 PCMCIA SCSI Connector and Cable (93-023r0) [Lohmeyer]
    4.5 SCSI Icon () [Penokie]

5.  General Working Group Items
    5.1 Proposed Electronic Notification Procedure (93-019r0) [Lamers]
    5.2 Report on CAM-2 Study Group () [Dallas]
    5.3 Queue Full Handling (92-214r1) [DeKoning]
    5.4 Multi-Pathing (91-199r2) [Stephens]

6.  SCSI-3 Architecture Model - SAM () [Monia]

7.  SCSI-3 Command Sets (SPC, SBC, SSC, SGC, and SMC)
    7.1 Third-party Commands (93-038r0) [Weber]
    7.2 Proposed Changes to SCSI-3 Dual Porting (93-041r0) [Houlder]
    7.3 Number of Blocks Field in Block Descriptors (93-032r0) [Penokie]
    7.4 Printer Command Set () [Heckmen]
    7.5 READ LONG Correct bit vs. DCR bit () [Milligan]
    7.6 Optical Density Codes (93-020r0) [Williams]

8.  Serial Protocol Topics
    8.1 SCSI-3 Serial Bus Protocol - SBP () [Marazas]
    8.2 SCSI-3 Fiber Channel Protocol - FCP () [Snively]
    8.3 SCSI-3 Generic Packetized Protocol - GPP () [Stephens]
    8.4 SCSI-3 Parallel Protocol [Lamers]
        8.4.1    SDP Message Clarification (93-034r0) [Lohmeyer]
        8.4.2    SDTR/WDTR Message Clarification (93-037r0) [Penokie]

9.  Meeting Schedule
10. Adjournment

**Results of Meeting**

## 1. Opening Remarks

John Lohmeyer the Chair, called the meeting to order at 9:00 a.m., Tuesday, March 16, 1993. He thanked Skip Jones of Emulex 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 X3T9.2 and would be conducted under the X3 rules. Ad hoc meetings take no final actions, but prepare recommendations for approval by the X3T9.2 task group. The voting rules for the meeting are those of the parent committee, X3T9.2. 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 X3T9.2 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:

```
                    X3T9.2 General Working Group Meeting Attenders

        Name            S       Organization          Electronic Mail Address
--------------------- - ------------------------ ------------------------
Mr. Denni Rash        O                          75450.3313@compuserve.com
Mr. Norm Harris       P Adaptec, Inc.            nharris@adaptec.com
Mr. Jan V. Dedek      P Ancot Corp.
Mr. Milton Scritsmier V Array Technology         milton@arraytech.com
                        Corp/Tandem
Mr. John Geldman       A Cirrus Logic Inc.
Mr. Louis Grantham     O Dallas Semiconductor
Mr. Charles Monia      P Digital Equipment Corp. monia@starch.enet.dec.com
Dr. William Ham        A Digital Equipment Corp. ham@subsys.enet.dec.com
Mr. Ralph Weber        A Digital Equipment Corp. weber@star.enet.dec.com
Mr. Edward A. Gardner  A Digital Equipment Corp. gardner@ssag.enet.dec.com
Mr. Richard Whalen     V Digital Equipment Corp. whalen@starch.enet.dec.co
                                                 m
Mr. David Switzer      V Digital Systems
                         Associates
Mr. Bruce A. Burr      V Digital Systems
                         Associates
Mr. Skip Jones         P Emulex Corp.            sk_jones@emulex.com
Mr. I. Dal Allan       P ENDL                    2501752@mcimail.com
Mr. Kenneth J. Hallam  S ENDL
Mr. D. W. Spence       A ENDL Associates         5051038@mcimail.com
Mr. Robert Liu         P Fujitsu Computer
                         Products,Am
Mr. Jeffrey L.         P Hewlett Packard Co.     jlw@hpdmd48.boi.hp.com
Williams
Mr. Howard Wang        O Hitachi Computer Products
Mr. George Penokie     P IBM Corp.               gop@rchvmp3.vnet.ibm.com
Mr. Gary R. Stephens   A IBM Corp.               gstephen@tucvm2.vnet.ibm.
                                                 com
Mr. Gerald Marazas     A IBM Corp.               marazas@bcrvmpc2.vnet.ibm
                                                 .com
Mr. John P. Scheible   O IBM Corp.               Scheible@sjevm5.vnet.ibm.
                                                 com
Mr. Gregory Floryance  S IBM Corp.
Mr. Giles Frazier      S IBM Corp.               gfrazier@austin.vnet.ibm.
                                                 com
Mr. Kevin R. Pokorney  O Intellistor, Inc.
Mr. Lawrence J. Lamers P Maxtor Corp.            71540.2756@compuserve.com
Mr. Bob Masterson      P Methode Electronics, Inc.
Mr. Thomas Newman      S Mission Peak Designs    71246.1573@compuserve.com
Mr. Robbie Shergill    P National Semiconductor
Mr. John Lohmeyer      P NCR Corp.               john.lohmeyer@ftcollinsco
                                                 .ncr.com
Mr. Rod DeKoning       S NCR Corp.               Rod.DeKoning@WichitaKS.NC
                                                 R.COM
Mr. Stephen F. Heil    P Panasonic Technologies,
                         Inc
Mr. James McGrath      P Quantum Corp.           75000.1241@compuserve.com
Mr. Gene Milligan      A Seagate Technology      Gene_Milligan@notes.seaga
                                                 te.com
Mr. Forrest Crowell    P SGS-Thomson             crowell@isnet.inmos.com
                         Microelectronics
Mr. Stephen G. Finch   P Silicon Systems, Inc.   5723283@mcimail.com
Mr. Robert N. Snively  P Sun Microsystems, Inc.  Bob.Snively@eng.sun.com
Mr. Alan Wetzel        A Texas Instruments       4274968@mcimail.com
Mr. Jeff Stai          P Western Digital         382-5280@mcimail.com or
                                                 stai@wdc.com
Mr. Tak Asami          A Western Digital         asami@wdc.com

42 people present

Status Key:  P  -  Principal
             A  -  Alternate
             O  -  Observer
             L  -  Liaison
```

```
S,V - Visitor
```

## 3.   Approval of Agenda

The proposed agenda was approved.

## 4.   SCSI-3 Parallel Inteface (SPI)

## 4.1 Report on Colo Sprgs Editing Session (855D r11) [Lamers]

Larry Lamers reported that a successful editing session on SPI was held.  He thanked NCR for hosting the session.  A significant amount of work was accomplished regarding the terminoloy for layering in clause 10.  See revision 11 of SPI.

## 4.2 Review of SPI revision 11 (X3T9.2/855D) [Lamers]

The "new" SCSI met with disbelief, discussion, and digression.  The embodiment of the layering into the inter-layer communication is a significant step forward in documenting the interface.  There were several questions on the service interface that were discussed at length.  A revision 12 will be prepared for the mailing and consideration of forwarding at the next plenary meeting.

Gary Stephen's had several comments on SPI.  He does not believe that the direction change setup times are included.  He wants an end of phase service (or phase select service).  There was a disagreement with his views; a lot of the disagreement turns around the interpretation of phase end in SCSI-2.  Gary stated that he will develop a service proposal to meet GPP needs.  This proposal will save GPP 80us when multiple packets are transmitted.

One of the key points debated was GPP's use of the ATN signal to perform back-to-back DATA OUT phases.  This type of behavior would not work in much of the current target silicon because the ATN signal is used to cause a MESSAGE OUT phase.  The negation of ATN during selection could also be a problem, since current silicon often interprets that as a SCSI-1/SASI selection and not a GPP packet out.

Gene Milligan questioned a part of the document that had not changed recommending that active negation drivers be used on REQ, ACK, REQQ, ACKQ, and the DATA BUS.  He felt that signal quality may be improved by only using active negation on the req and ack signals, to avoid crosstalk from the DATA BUS signals.  John Lohmeyer argued that using different driver types would cause problems meeting the setup and hold times for fast transfers and that the "crosstalk" was probably ringing due to marginal implementation of active negation (not meeting the rise and fall time specs).  No consensus was reached.

## 4.3 Power Connector Pin & Cavity () [Dambach]

Joe Dambach surveyed connector manufacturers.  He has a reasonable set of responses, but needs clarification from one before submitting his recommendations.  It is anticipated that these results will be submitted for EIA.

**4.4 PCMCIA SCSI Connector and Cable (93-023r0) [Lohmeyer]**

No report because the group that is working this topic has not met.

**4.5 SCSI Icon () [Penokie]**

George Penokie showed several symbols in use by ISO to designate storage. There is a concern within IBM that the SCSI icon closely resembles these symbols. John Lohmeyer recounted the development of the SCSI icon from its original request by Apple Computer in 1986. The Apple Icon Designer had modified the ISO external channel icon to create the SCSI icon. Hence the close resemblance to the ISO symbol for external storage is intentional.

**5.   General Working Group Items**

**5.1 Proposed Electronic Notification Procedure (93-019r0) [Lamers]**

Larry Lamers, again in target role, received a great many pointed arrows.

One concern regarding an archive facility for the email is not addressed in the proposal. There are several ways of doing this; the ways need to be investigated.

A request was made to be able to provide the email through an ftp service or via a usenet group. Also suggested was having each email transmission numbered consecutively to provide a tracking mechanism to know that all the email transmitted has been received.

A procedure for dealing with bounced email is needed, with an alternate means of notification.

Gene Milligan suggested that X3T9.2 draft a letter of appreciation to John Pederson of NCR who has been administering the SCSI reflector.

The electronic notification topic will be re-visited at the plenary meeting. John Lohmeyer and Larry Lamers will investigate the issues raised for possible solutions.

**5.2 Report on CAM-2 Study Group () [Dallas]**

John Lohmeyer reported. Bill Dallas was unable to attend due to weather. A revision 3.1 CAM document was reviewed. It is not clear whether it is a complete list of changes to address the public reveiw comments. Ralph Weber pointed out that the target mode operation revisions are still being developed.

The document incorporating the comments from the ISO editor has been received. It does not incorporate the proposed 3.1 revisions.

DEC has proposed their SIMPORT interface for consideration as a CAM-2 activity. It sits below the SIM interface and performs all SIM tasks except for virtual/physical address translation. The document will be included in the next mailing.

**5.3 Queue Full Handling (92-214r1) [DeKoning]**

Rod DeKoning presented a proposal that would provide an initiator information on the queue depth. This information is contained in the control mode page.

There was considerable discussion with little consensus. The opinions ranged from "Queuing is broken and must be fixed" to "Nothing is wrong if the initiators would just use common sense when they receive a QUEUE FULL status". We couldn't even agree on when to talk about the issues again.

**5.4 Multi-Pathing (91-199r2) [Stephens]**

Gary Stephens presented his model of multi-pathing. Revision 2 was distibuted in mailing #6 of 1992.

**6.  SCSI-3 Architecture Model - SAM () [Monia]**

Charles Monia presented revision 7 of SAM.

Feedback was received on the following issues:

Section 7.3 Command Descriptor Format - The reviewers requested inclusion of tables describing command descriptor formats for 6-, 10-, 12- and 16-byte CDBs.

PP 30: TASK SET FULL description, Section 7.7, PP 38 Unit Attention:  Ed Gardner said that the document needs to distinguish between receiving a command and entering the associated task into the task set.  In certain cases, the document incorrectly implies that receiving a task and task set inclusion are synonymous.  If an ACA is in effect, for example, a command may be received but the resulting task can be rejected for inclusion in the task set.

Several paragraphs in the section are now conflict with auto contingent allegiance and need to be deleted or modified.

Section 7.6.7, PP 37 Autosense - Jim McGrath suggested that this section be based on the CAM autosense model.

Section 8 - Task Set Management - This section was included as passed by the plenary, with initial edits to incorporate SAM concepts and proposals for additions and deletions. During the meeting, the following changes were agreed upon:
1) The concept of an Untagged Task will be deleted from SAM.
2) The concept of current and pending tasks applies only to SIP/SPI and will be removed from SAM.
3) The concept of "Suspended Data" needs an in-depth description.
4) In section 8.4.1, the implementors note on SCSI-2 compatibility will be moved to SIP.
5) The material on task ordering boundaries (section 8.3) will be supplemented with an extensive tutorial annex.  The missing explanatory figure will be added.

The next version of the draft standard will incorporate the above changes and integrate sections 7 and 8 with the rest of the specification.

In all subsequent versions, an editing log of changes will be included.  In, addition, a verbatim copy of the queuing model, as passed by the committee, will be included as a temporary annex.  This version will be annotated to describe modifications made when incorporating into SAM.

## 7.   SCSI-3 Command Sets (SPC, SBC, SSC, SGC, and SMC)

### 7.1 Third-party Commands (93-038r0) [Weber]

Ralph Weber made a presentation on third-party commands (see 93-038r0).  Addressing is the major issue.  One way to deal with this is by using a THIRD-PARTY SETUP command.

An issue was raised regarding addressing and transport specific information.  Transport specific information should not be contained in the COPY parameters.  These parameters are per SAM.

Gary Stephen's previous proposal contained fields that provide the expected INQUIRY data.  The copy manager could use this to verify the destination.   The group did not like this.

Ralph will take the comments and incorporate them in his document.

### 7.2 Proposed Changes to SCSI-3 Dual Porting (93-041r0) [Houlder]

Gene Milligan presented the proposal.  This is really a follow-on to the 91-149 document to show the proposed changes.

Hard reset applies to both ports and unit attention is generated for all initiators.  Gene mentioned that Seagate uses a mode parameter to select between this implementation and the former one.  Gene accepted an action item to revise the proposal to include a similar mechanism (mode bit to select which reset option).

A port status command is included.  The debate over the initiator management functions ensued.  There was not a clear consensus to adopt this.  It will be on the agenda for the April plenary meeting.

### 7.3 Number of Blocks Field in Block Descriptors (93-032r0) [Penokie]

George Penokie submitted a proposal to resolve an issue with the size of the number of blocks field in READ CAPACITY vs. that in the MODE SELECT block descriptors.  He will incorporate several comments received into revision 1.

### 7.4 Printer Command Set () [Heckmen]

Ray Heckman was not present.  This item will be dropped from future agendas until/unless a proposal is received.

### 7.5 READ LONG Correct bit vs. DCR bit () [Milligan]

Gene Milligan pointed out a conflict between the correct bit in the READ LONG command and the DCR bit.  Gene will develop a proposal to define what the target should do when this conflict occurs (return CHECK CONDITION status).

### 7.6 Optical Density Codes (93-020r0) [Williams]

This proposal will be on the agenda for plenary vote.  Recommended for acceptance.

## 8.  Serial Protocol Topics

### 8.1 SCSI-3 Serial Bus Protocol - SBP () [Marazas]

Ed Gardner reported (see X3T9.2/93-040r0 for details).  Ed mentioned that there is an ongoing discussion on command descriptor block alignment within the packet structure (see X3T9.2/93-042r0).

The next SBP meeting is April 7-8, 1993 at Apple Computer in Cupertino, CA.

### 8.2 SCSI-3 Fiber Channel Protocol - FCP () [Snively]

Bob Snively presented the status of the FCP document:

```
                    FCP
Status
     Editorial updates complete
     Technical corrections under study.
Technical
     Class 1 Operation
          ? Dedicated Class 1 Operation
               limiting connectivity
               no sequence streaming
          * Class 1 Connection/Sequence
               full connectivity
               performance limitations
               frequent connection formation
     Operation w/o RO
          Restricts data xfer to single sequence.
     P1275 (open boot standard)
          Complete definition
     Reset
          Refine
```

### 8.3 SCSI-3 Generic Packetized Protocol - GPP () [Stephens]

Gary Stephens (IBM) elected to meet in parallel with the main session on Tuesday evening.  Please contact Gary for details.

### 8.4 SCSI-3 Parallel Protocol [Lamers]

An editing session to work on the layering terminology for SIP, based on that developed for SPI will be held on April 5-6, 1993 in San Jose, CA.  Contact Larry Lamers @ 408-432-3889 for details.

### 8.4.1   SDP Message Clarification (93-034r0) [Lohmeyer]

Another round of copius discussion.  This information is contained in SCSI-2 in at least two places.  The document will be duly noted for future considerations when SIP is developed.

### 8.4.2   SDTR/WDTR Message Clarification (93-037r0) [Penokie]

This proposal clarifies that following all WDTR negotiations an SDTR negotiation ensues.  What happens if the WDTR message is rejected needs to be worked out.  The comments will be addressed in revision 1.

## 9.   Meeting Schedule

The next meeting of the General Working Group will be May 18-19, 1993 at the High Mesa Inn (505-473-2800) in Sante Fe, NM hosted by Los Alamos National Laboratory.  The room rates are $79.00 including tax.  The reservation deadline for these rates is April 16, 1993.

## 10. Adjournment

The meeting was adjourned at 5:00 p.m. on Wednesday March 16, 1993.