

To: Membership of X3T9.2  
From: Lawrence J. Lamers/John B. Lohmeyer  
Date: May 14, 1992  
Subject: Minutes of X3T9.2 Plenary Meeting #99

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**Agenda -- X3T9.2 Meeting #99  
St. Petersburg Beach, FL -- April 27, 1992**

1. Opening Remarks
2. Approval of Agenda
3. Attendance and Membership-
  - 3.1 Roll Call of Members in Jeopardy
4. Approval of Minutes - February Meeting Austin, TX (X3T9.2/92-040)
5. Document Distribution
6. Liaison Reports and Call for Patents
  - 6.1 ISO [Milligan]
  - 6.2 IT8 [Lohmeyer]
  - 6.3 Fibre Channel [Allan]
  - 6.4 Small Form Factor Industry Group [Allan]
  - 6.5 IEEE P1394 [Smyers]
  - 6.6 Call for Patents
7. Review of Old Action Items
8. Working Group and/or Project Status Reports
  - 8.1 AT Attachment Status (ATA)
  - 8.2 Directly-Addressable Device Interface (DADI)
  - 8.3 SCSI Common Access Method (CAM) (92-088) [Gallant]
  - 8.4 SCSI General Working Group (X3T9.2/92-71)
  - 8.5 SCSI-2 Status
  - 8.6 SCSI-3 Parallel Interface (SPI) Status (X3T9.2/92-72, 87) [Spence]
    - 8.6.1 Acceptance of SPI Rev 3.0 as draft Working Document
    - 8.6.2 Removal of SCSI-1 Termination
  - 8.7 SCSI-3 Interlocked Protocol (SIP) Status
  - 8.8 SCSI-3 Packetized Protocol (SPP) Status
  - 8.9 SCSI-3 Command Set (SCS) Status
  - 8.10 SCSI-3 Connector Contacts (X3T9.2/92-76) [Penokie]
  - 8.11 ATA Extensions (X3T9.2/92-70)
9. Old Business
  - 9.1 Enhancement of Sequential Access for Medium Changers (92-6) [Jones]
  - 9.2 Alternate P Cable Connector for SCSI-3 [Smyers, Marazas]
  - 9.3 SCSI-3 Contact Requirements (92-35) [Penokie/Mosley]
  - 9.4 SCSI-3 Queuing (91-98 R7) [Penokie]
10. New Business
  - 10.1 Forwarding Motion of SCSI-2 CAM XPT/SIM
  - 10.2 Request for new Additional Sense Codes (92-46) [Houlder]
  - 10.3 Request for Sequential-Access Density Codes (92-47,83) [Gardner,Washburn]
  - 10.4 Proposal to Support Media Interchange (92-56) [Wilhelm]
  - 10.5 Review of new documents
  - 10.6 Agenda for the May X3T9.2 General Working Group
  - 10.7 IEEE Disk Attach/Scalable Storage Interface (92-098) [Freeman]

- 10.8 PR Comments on BSR X3.221-199x, ATA (AT Attachment)
- 10.9 Resolution of X3 Negatives on ATA Extensions Project Proposal (92-\_\_)
- 10.10 Presentation on SGS-Thomson Serial Link Technology [Crowell]
- 11. Review of Action Items
- 12. Meeting Schedule
  - 12.1 Working Group Schedule
  - 12.2 Authorization of Working Group Meetings
- 13. Adjournment

## Results of Meeting

### 1. Opening Remarks

John Lohmeyer, the Chair, called the meeting to order at 9:00 a.m., Monday April 27, 1992. He thanked Chuck Brill of AMP for hosting the meeting. John also pointed out that this meeting marks the tenth anniversary of SCSI. The SCSI project proposal was approved by X3T9.2 at the April 1982 meeting in Phoenix, AZ.

John said that the X3 Secretariat prefers receiving membership changes on the "X3 Subgroup Membership Forms" which were available on the document table. He said that people should use the X3 forms to insure the X3 Secretariat has the latest membership information. The forms should be mailed to the X3 Secretariat with a copy to John Lohmeyer.

As is customary, the people attending introduced themselves. A copy of the attendance list was circulated for attendance and corrections. Copies of the draft agenda and the recent document register were made available to those attending. Information on X3T9.2 and Mailing Subscription Forms were made available.

### 2. Approval of Agenda

The draft agenda was approved with the following deletion:

9.1 SCSI Data Phase LRC (91-176R1) [Penokie]

### 3. Attendance and Membership

The membership requirements were reviewed. X3 rules permit one vote per organization. An individual from a new organization must attend two out of three consecutive plenary meetings. He/she may apply for voting membership the second meeting via a letter to the Chair of X3T9.2. The individual may vote at the second plenary meeting. Working group meetings do not count toward attendance requirements.

With the addition of three organizations at the meeting and one termination for nonattendance (see 3.1), the X3T9.2 voting membership is now at 60 organizations up from 58 at the last meeting. Enclosure (1) is the list of the people present at the meeting and enclosure (2) is the current X3T9.2 membership list.

CMD Technology requested membership with Mr. Edward Haske as the principal member. Micropolis Corporation requested membership with Mr. Raymond Yule as the principal member and Ken Erickson as the alternate member. Yamaichi Electronics, Inc. requested membership with Mr. Steve Drake as the principal and Mr. Masafumi Aoki as the alternate member.

#### 3.1 Roll Call of Members in Jeopardy

The Chair said he had sent jeopardy letters to 30 people from 10 organizations: Burndy, Connector Ind. Consulting Group, Extended Systems, Hirose, Hitachi, Maxoptix, NEC, Nat. Inst. of Stnds. & Tech., Sun Microsystems, and UNISYS.

The letters said that these organizations had failed to attend two of the last three plenary meetings and that their membership would be terminated unless they attended this meeting. The letters also informed these people of the committee's ability to retain their membership under special circumstances in spite of their failure to attend.

Al Youngwerth contacted John Lohmeyer to say that Extended Systems had decided to not become voting members of X3T9.2 and he had informed the Secretariat of their decision.

Representatives were present from all organizations in jeopardy except Extended Systems. No other organizations were changed to observer status.

#### 4. Approval of Minutes - February Meeting Austin, TX (X3T9.2/92-040)

The minutes were approved as written.

Gene Milligan objected to ballot on page 11 of the mailing. He noted that the third column "Not Voting" should be removed since it was redundant.

#### 5. Document Distribution

John Lohmeyer said that the committee mailing had gone out just after the last set of working group meetings and that the X3 Secretariat had processed it expeditiously so that the members would receive it more than two weeks prior to the meeting. Members who have any problems with their mailing subscription should deal directly with Katrina Gray at (202) 626-5741.

Larry Lamers requested that all documents for the next mailing be sent to him by noon on Thursday May 14, 1992. Documents received at the May working group meetings will not be in the mailing.

As usual, minutes are also available on the SCSI BBS (719-574-0424) and will be distributed to the SCSI Reflector E-mail list. To be added to the SCSI Reflector, send an electronic message to: scsiadm@WichitaKS.NCR.COM. Note that the SCSI BBS number is new and will be effective from May 12, 1992 onward.

The following new or revised documents were distributed and/or discussed at the meeting:

| Document           | Doc Date | Author        | Description of Document                        |
|--------------------|----------|---------------|------------------------------------------------|
| X3T9.2/92-35 Rev 2 | 4/28/92  | G. Penokie    | SCSI-3 Alt 1 Connector Requirements            |
| X3T9.2/92-45 Rev 1 | 4/27/92  | C. Monia      | Introduction to Packetized SCSI                |
| X3T9.2/92-77       | 4/13/92  | John Lohmeyer | Response to M. Freeman of MSC on his letter    |
| X3T9.2/92-78       | 4/6/92   | M. Freeman    | Letter to John Lohmeyer on MAT/MS P1285        |
| X3T9.2/92-79 Rev 0 | 4/24/92  | Charles Monia | SCSI-3 Architect Model (SAM)                   |
| X3T9.2/92-80       | 4/27/92  | F. Crowell    | DS-Links Technical Information                 |
| X3T9.2/92-83       | 4/27/92  | S. Washburn   | Request for Sequential Access Density Codes    |
| X3T9.2/92-84 Rev 1 | 4/24/92  | L. Lamers     | Preparing Documents for Committee Mailings     |
| X3T9.2/92-85       | 4/27/92  | G. Penokie    | CHANGE INQUIRY Command                         |
| X3T9.2/92-86       | 4/27/92  | D.W. Spence   | SCSI Implementation in a 3.3 volt Environment  |
| X3T9.2/92-87       | 4/27/92  | D.W. Spence   | Key Changes Proposed for the SPI Standard      |
| X3T9.2/92-88       | 4/23/92  | J. Gallant    | Two Changes for the CAM document               |
| X3T9.2/92-90       | 4/27/92  | F. Crowell    | Foils of Serial DS-Link Technology             |
| X3T9.2/92-91       | 4/8/92   | J. McGrath    | Tolerance Analysis of P-cable Connection       |
| X3T9.2/92-93       | 4/27/92  | B. Ham        | SCSI-3 Connector Framework                     |
| X3T9.2/92-94       | 3/13/92  | I. Dal Allan  | Information Package on 1988 Connector Decision |
| X3T9.2/92-96       | 4/27/92  | T. Asami      | Pin Capacitance of a SCSI Controller LSI       |
| X3T9.2/92-97       | 4/27/92  | B. Ham        | Requirement for Glitch Free Power Up/Down      |
| X3T9.2/92-98       | 4/29/92  | M. Freeman    | IEEE P1285 PAR                                 |
| X3T9.2/92-99       | 4/13/92  | I. Dal Allan  | Connector Agenda Items                         |

The current document register is enclosure (3).



## 6. Liaison Reports and Call for Patents

## 6.1 ISO [Milligan]

Gene Milligan, the X3T9 International Representative, gave an oral report and later provided an electronic report to X3T9 (which was taken from a letter dated 4/21/92 from Gene to Judith Anderson of EIA):

Subject: SC 25/WG 4 TAG (X3T9) Report

Since the last SC 25 meeting, during January in Las Vegas, WG 4 has had one meeting during October in Bremen. The TAG, X3T9, has had seven meetings since the SC 25 meeting.

The TAG's annual report, January 1992, included the following project summary.

| X3 Project |      |              | -- IEC/ISO JTC1 # -- |                 |                 |        |
|------------|------|--------------|----------------------|-----------------|-----------------|--------|
| #          | Type | Title        | ASC #                | Est. Complete # | Proj. Doc. #    | ECMA # |
| 541D       | I/O  | FDDI PMD     | X3.166-1989          | 11/90           | 1.05 IS9314-3   | ----   |
| 379D       | I/O  | FDDI PHY     | X3.148-1988          | 12/88           | 1.03 IS9314-1   | ----   |
| 380D       | I/O  | FDDI MAC     | X3.148-1987          | 1987            | 1.04 IS9314-2   | ----   |
| 503D       | I/O  | FDDI SMT     | -----                | 1993            | 1.08 WD9314-6   | ----   |
| 573D       | I/O  | FDDI HRC     | X3.186-199X          | 1993            | 1.07 DIS9314-5  | ----   |
| 651D       | I/O  | FDDI SMF-PMD | X3.184-199X          | 1993            | 1.06 CD9314-4   | ----   |
| 684D       | I/O  | FDDI MAC-2   | -----                | 1993            | 1.?? -----      | ----   |
| 761D       | I/O  | FDDI PHY-2   | -----                | 1993            | 1.?? -----      | ----   |
| 378D       | I/O  | SCTD         | X3.146-1987          | N/A             | 10.05 IS9317    | ----   |
| 370D       | I/O  | IPI PL       | X3.129-1986          | 1992            | 10.06 IS9318-1  | ----   |
| 467D       | I/O  | IPI-2 DISK   | X3.130-1986          | 12/90           | 10.07 IS9318-2  | ----   |
| 496D       | I/O  | IPI-3 DISK   | X3.132-1987          | 12/90           | 10.08 IS9318-3  | ----   |
| 505D       | I/O  | IPI-3 TAPE   | X3.147-1988          | 12/90           | 10.09 IS9318-4  | ----   |
| 591D       | I/O  | IPI-2 TAPE   | X3.166-1990          | 1992            | 10.12 IS9318-5  | ----   |
| 790D       | I/O  | IPI ENH PL   | X3.201-199X          | 1992            | 10.14 CD9318-6  | ----   |
| 504D       | I/O  | IPI-3 COM    | X3.166-1990          | N/A             | 10.10 -----*    | ----   |
| 53R        | I/O  | SMD-E        | X3.91-1987           | 1992            | 10.03 IS9324    | ----   |
| 587D       | I/O  | ESDI         | X3.170-199X          | 1992            | 10.12 IS10222   | ----   |
| 375R       | I/O  | SCSI-2       | X3.131-199XR         | 1993            | 10.13 DIS9316.2 | ----   |
| 667D       | I/O  | HIPPI-PH     | X3.183-199X          | 1992            | 10.15 CD11518-1 | ----   |

N/A PROF FDDI ISP

N/A

Withdrawn

\* Discontinued.

Since then the following key items have occurred.

X3T9 recommended that the U.S. vote on DIS 9314-5 be "Yes with the comment that FDDI HRC Revision 6.2 be substituted for Revision 6.1 for the International Standard. A summary list of changes from 6.1 to 6.2 was provided. The DIS closed 2/8/92 with a vote of approval 19:2:2 with comments from Germany, Japan, U.S., and the ITTF.

X3T9/IR9202 contained the following New Work Item proposals for eventual completion by ISO/IEC JTC 1/SC 25/WG 4:

- NWI - High-Performance Parallel Interface (HIPPI) Framing Protocol (FP)
- NWI - High-Performance Parallel Interface (HIPPI) Encapsulation of ISO 8802-2 Logical Link Control Protocol Data Units (LE)
- NWI - High-Performance Parallel Interface (HIPPI) Physical Switch Control (SC)
- NWI - High-Performance Parallel Interface (HIPPI) Memory Interface (MI)
- NWI - Fibre Channel (FC) Physical and Signaling Interface (PH)

Information copies of the related dpANS have been submitted for all save the HIPPI-MI which has not reached the X3T9 stage as yet.

We have also processed the HIPPI-PH CD Letter Ballot comments and submitted DIS 11 518-1 Draft 8.2 - High-Performance Parallel Interface (HIPPI)

Part 1: Mechanical, Electrical, and Signaling Protocol Specification (PH) along with the reply to Germany's comments on CD 11 518-1.

The SC 25/WG 4 TAG, X3T9, expects to continue the process of making a decision to propose dpANS as international standards near the time of forwarding from X3T9 for further processing. This allows international examination concurrent with the U.S. public review. Anticipated projects include ATA, FDDI SPM, FDDI Conformance, Fiber Channel FC4s, HIPPI-IP1, IPI-2E, SCSI-CAM, and SCSI-3. In the longer term projects on FFOL and further variations of SCSI are anticipated.

The SC 25/WG 4 technical experts for the 9-11 June meeting in Milan are:

|                                    |                    |
|------------------------------------|--------------------|
| Gene Milligan (Head of Delegation) | Lawrence J. Lamers |
| Seagate Technology Inc.            | Maxtor Corp.       |

|            |                         |
|------------|-------------------------|
| Floyd Ross | Del Shoemaker           |
| Timeplex   | Digital Equipment Corp. |

|             |                          |
|-------------|--------------------------|
| Frank Shott | Geoffrey O. Thompson     |
| IBM         | SynOptics Communications |

In addition Frank Shott has requested permission to present a liaison report on Fibre Cabling from WG 4 to WG 3. X3T9 will review his proposed liaison report at their April meeting. If approved we will then have WG 4 review it prior to a WG 3 presentation. Assuming X3T9 approves, the IR will send a request through channels requesting a potential liaison report at the WG 3 meeting.

G.E. Milligan  
X3T9 International Representative

## 6.2 IT8 [Lohmeyer]

John Lohmeyer had nothing new to report.

## 6.3 Fibre Channel [Allan]

Dal Allan reported. The fiber channel physical interface document passed X3T9 letter ballot. There were votes of yes with comments. There are no major technical issues. There is a bit of a firefight over the class 3 datagrams on reliability. Four committees are active in defining use of fiber channel. It is expected that the decisions on low cost topology will be made at the next fiber channel meeting.

## 6.4 Small Form Factor Industry Group [Allan]

Dal Allan reported. Connector decisions have been made, and there are three choices. The next order of business is to look at the 1.9-inch disk drive.

## 6.5 IEEE P1394 [Smyers]

Scott Smyers reported. There is a new reflector for P1394 (P1394@sun.com). To join, send e-mail to bob.snively@eng.sun.com. The P1394 reflector is also available in file area 23 of the SCSI BBS.

Note: Area 25 of the SCSI BBS now has announcements from X3 concerning public review periods and other X3 activities.

## 6.6 Call for Patents

This is a regular agenda item to identify any potential patent issues with developing standards. Patents that may be related to various X3T9.2 projects are a PrairieTek patent on power management, a Maxtor patent on spindle synchronization, and a AMD patent application on a glitch tolerance circuit. Dal Allan mentioned that there may be a Western Digital patent pending on drives which automatically adapt to AT bus backplane speeds.

A document is available from ANSI, "Procedures for the Development and Coordination of American National Standards", at no charge. The last page contains the ANSI patent policy.

John Lohmeyer stated that he recently received another ANSI document, "Guidelines for Implementation of The ANSI Patent Policy - An Aid to More Efficient and Effective Standards Development in Fields That May Involve Patented Technology". However this document has a copyright and cannot be distributed in the mailing.

John also stated that a new X3/SD-2, "Organization, Rules and Procedures" is now in effect. A copy may be obtained by calling Joanne Flanagan, 202-626-5752.

## 7. Review of Old Action Items

1. Kurt Chan will include 92-007R1 in SPI as an informative annex. **This action item has been assumed by Larry Lamers.**
2. Scott Smyers will investigate making the P1212, P1212.1, and P1394 documents available electronically on the SCSI BBS in ASCII format. **Scott noted that 1212 is not a 'P' anymore so is not available except through regular channels.**
3. Scott Smyers to investigate providing P1394 through Global Engineering Documents. **Dropped.**

## **8. Working Group and/or Project Status Reports**

### **8.1 AT Attachment Status (ATA)**

John Lohmeyer reported. So far, one registered public review period comment on ATA has been received from Roland Whatcott of Novell (92-81). John had also received unregistered copies of public review comments from Western Digital (92-74) and Intel (92-110). The public review period closes July 6, 1992. (See agenda item 10.8.)

The question arose of whether or not a NWI should be submitted on ATA to start the process of developing an ISO standard based on ATA. If an editor can be found for this work, it will be considered.

### **8.2 Directly-Addressable Device Interface (DADI)**

See also item 10.7.

### **8.3 SCSI Common Access Method (CAM) (92-088) [Gallant]**

John Gallant presented his comments on CAM. He requested a four-byte field that is vendor unique and provided an update to the C-code header correcting the control blocks. The request is to take one of the current reserved fields in the SCSI I/O Request block. In the absence of any objections the request was granted.

### **8.4 SCSI General Working Group (X3T9.2/92-71)**

John Lohmeyer reported that the serial bus discussion at the working group got truncated so a special working group was scheduled for Monday evening. The discussion of Kevin Jones's medium changer proposal finally occurred. Al Wilhelm appeared and made a pitch for adding a removable media feature to SCSI-3. See document 92-071 for details.

### **8.5 SCSI-2 Status**

SCSI-2 is in public review, which ends July 6, 1992. The project editor appealed to the constituency for review of the document.

### **8.6 SCSI-3 Parallel Interface (SPI) Status (X3T9.2/92-72, 87) [Spence]**

Bill Spence requested a vote on specific items to get approval of the direction the SPI working group. Bill reviewed his proposed list of changes to SCSI-2 that are in the SPI document (92-087).

Dal Allan stated that if there are no specific objections a general approval vote was more meaningful.

#### **8.6.1 Acceptance of SPI Rev 3.0 as draft Working Document**

Dal Allan moved and Kurt Chan seconded that X3T9.2/91-10 Rev 3 be accepted as the working draft document for Project 855-D. The motion passed 35:1:0.

### **8.6.2 Removal of SCSI-1 Termination**

Gene Milligan moved and Jeff Stai seconded that 220/330 ohm resistor-divider terminator circuit be disallowed in the SCSI-3 Parallel Interface document. The motion passed 32:1:0.

### **8.7 SCSI-3 Interlocked Protocol (SIP) Status**

The document is at revision 1 and was included in the last mailing.

Dal Allan moved and John Lohmeyer seconded that X3T9.2/91-11 Rev 1 be accepted as the working draft document for Project 856-D. The motion passed 22:0:0.

### **8.8 SCSI-3 Packetized Protocol (SPP) Status**

The document is now called Generic Packetized Protocol. It is at revision 2 and was included in the last mailing.

### **8.9 SCSI-3 Command Set (SCS) Status**

At a previous working group it was recommended that the command sets be grouped into block, stream, and other device types and put in separate documents. Dal Allan has drafted project proposals for these documents. The proposals are on the BBS in file area 9. The plan is to withdraw the existing single command set proposal and replace it with the several.

### **8.10 SCSI-3 Connector Contacts (X3T9.2/92-76) [Penokie]**

George Penokie reported that the previous and last working group meeting on connector contact requirements had successfully established a set of requirements. The working group recommended adoption of these for the SCSI-3 Parallel Interface. (See agenda item 9.3.)

### **8.11 ATA Extensions (X3T9.2/92-70)**

John Lohmeyer reported that the Project Proposal for the ATA Extensions had passed the X3 letter ballot by a vote of 34:3:2:2 (see 92-82). The no votes were from Apple, IBM, and Wang, all citing concerns with backward compatibility. Once X3T9 responds to the negative votes, a project number will be assigned and a press release will be distributed. (See agenda item 10.9.)

## **9. Old Business**

### **9.1 Enhancement of Sequential Access for Medium Changers (92-6) [Jones]**

Dal Allan recapped Kevin Jones's presentation from the working group. Manipulating "volumes" within a cartridge/caddy has hints of medium changers but is not really a medium changer. A model will be developed that reflects this. The most important issue is to orchestrate the wording for Project Editors to incorporate the three commands needed for device's to manipulate the media. The revised proposal is expected at the Harrisburg WG.

## **9.2 Alternate P Cable Connector for SCSI-3 [Smyers, Marazas]**

Ken Wolfswinkel of 3M made a presentation. Bob Herron of 3M presented results of ESD tests performed by an independent lab.

Bill Hamm made a presentation of connector requirements from a system integrator viewpoint. Bill had a connector feature matrix that he requested input on from all contenders to make a more objective evaluation.

Bob Snively recounted Sun Microsystems experience with SCSI-2 cables. He reported that approximately 1 SCSI cable in 10000 experiences a reported failure. In the statistical sample, all failures have been on deep form factor systems and he theorized the reason is people jam the system box up against a wall, damaging the cable, but not the connector. In a few cases where the SCSI port is mated/unmated every day there has been an occasional bent pin. The anecdotal evidence implies that the failure rate is even lower than 1 in 10000. A bent pin is easily detected, often repairable, and sometimes requires a cable replacement. There are no recorded instances of socket failures. The current connector is apparently adequate for current system needs and he doubts that experience with the other connector families will be significantly better. It is tooled, the assembly tooling is available, and, because it has been a standard for some time, a sufficient variety of connector styles are available. Many companies have worked hard together and spent a significant amount of money to bring it to its present state of robustness.

Bill Spence stated his opinion on the current state of connector affairs and the negative impact of a decision to add an alternate connector would have on the standards efforts.

## **9.3 SCSI-3 Contact Requirements (92-35) [Penokie/Mosley]**

George Penokie presented the results of the previous contact working group meeting. See document 92-035R2. The issue raised by Jim McGrath of Molex regarding a dimensional tolerance problem will be dealt with at the next working group.

George Penokie moved and Donna Pope seconded that 92-035R2 be accepted for inclusion in SCSI-3 Parallel Interface document. The motion passed 23:0:0.

## **9.4 SCSI-3 Queuing (91-98 R7) [Penokie]**

The latest revision of the document is on the BBS. There is still some work needed. This should be done at the next working group.

## **10. New Business**

### **10.1 Forwarding Motion of SCSI-2 CAM XPT/SIM**

John Lohmeyer noted that when he had spoken to Al Youngwerth of Extended Systems, Al had indicated that their comments on CAM had been satisfactorily addressed.

Dal Allan moved and John Gallant seconded that document 92-088 be accepted as a revision to the CAM document. The motion passed 25:0:0.

Dal Allan moved and Scott Smyers seconded to forward SCSI-2 CAM XPT/SIM (90-186 Rev 2.7) as revised to X3T9 for further processing. A roll-call vote was taken as follows:



| Organization                 | Name                    | Yes | No | Abs | NP      |
|------------------------------|-------------------------|-----|----|-----|---------|
| 3M Company                   | Mr. Ken Wolfswinkel     | 1   |    |     |         |
| AMP, Inc.                    | Mr. Charles Brill       | 1   |    |     |         |
| NCR Corp.                    | Mr. John Lohmeyer       | 1   |    |     |         |
| Adaptec, Inc.                | Mr. Norm Harris         | 1   |    |     |         |
| Advanced Micro Devices       |                         |     |    |     | 1       |
| Amphenol Interconnect        | Mr. Jeff Rosa           | 1   |    |     |         |
| Ancot Corp.                  | Mr. Jan V. Dedek        | 1   |    |     |         |
| Apple Computer               | Mr. Scott Smyers        | 1   |    |     |         |
| Archive Corp.                |                         |     |    |     | 1       |
| Berk-Tek, Inc.               |                         |     |    |     | 1       |
| Zenith Data Systems          | Mr. Saied Zangenehpour  | 1   |    |     |         |
| Burndy Corp.                 |                         |     |    |     | 1       |
| CMD Technology               | Mr. Edward Haske        | 1   |    |     |         |
| Ciprico Inc.                 | Mr. Kurt Witte          | 1   |    |     |         |
| Cirrus Logic Inc.            |                         |     |    |     | 1       |
| Connector Ind. Consulting    | Mr. Michael Lazar       | 1   |    |     |         |
| Conner Peripherals           | Mr. Stephen R. Cornaby  | 1   |    |     |         |
| Control Data Corp.           |                         |     |    |     | 1       |
| Data General Corp.           |                         |     |    |     | 1       |
| Digital Equipment Corp.      | Mr. Charles Monia       | 1   |    |     |         |
| ENDL                         | Mr. I. Dal Allan        | 1   |    |     |         |
| Emulex Corp.                 | Mr. Skip Jones          | 1   |    |     |         |
| Exabyte Corp.                | Mr. Edward Lappin       | 1   |    |     |         |
| Foxconn International, Inc.  | Mr. Stan Sharp          | 1   |    |     |         |
| Fujitsu Computer Products    | Mr. Robert Liu          | 1   |    |     |         |
| Furukawa Electric America    |                         |     |    |     | 1       |
| Future Domain                | Ms. Chris Borgers       | 1   |    |     |         |
| Hewlett Packard Co.          | Mr. Jeffrey L. Williams | 1   |    |     |         |
| Hirose Electric U.S.A.       |                         |     |    |     | 1       |
| Hitachi Micro Systems, Inc.  | Dr. Sam Karunanithi     | 1   |    |     |         |
| Honda Connector              |                         |     |    |     | 1       |
| IBM Corp.                    | Mr. George Penokie      | 1   |    |     |         |
| Interphase Corp.             | Mr. David Lawson        | 1   |    |     |         |
| Iomega Corp.                 |                         |     |    |     | 1       |
| JAE                          | Mr. David H. Shaff      | 1   |    |     |         |
| Madison Cable Corp.          | Mr. Robert Bellino      | 1   |    |     |         |
| Maxoptix Corp.               | Ms. Donna Pope          | 1   |    |     |         |
| Maxtor Corp.                 | Mr. Lawrence J. Lamers  | 1   |    |     |         |
| Methode Electronics, Inc.    |                         |     |    |     | 1       |
| Micropolis Corp.             | Mr. Raymond C. Yule     | 1   |    |     |         |
| Molex Inc.                   | Mr. Jim McGrath         | 1   |    |     |         |
| NEC Technologies Inc.        | Mr. Bruce Anderson      | 1   |    |     |         |
| NEK Cable, Inc.              |                         |     |    |     | 1       |
| Nat. Inst. of Stnds. & Te    |                         |     |    |     | 1       |
| National Semiconductor       |                         |     |    |     | 1       |
| Panasonic Technologies, Inc. | Mr. Stephen F. Heil     | 1   |    |     |         |
| Quantum Corp.                | Mr. James McGrath       | 1   |    |     |         |
| Ricoh Corporation            |                         |     |    |     | 1       |
| SGS-Thomson Microelectron    | Mr. Forrest Crowell     | 1   |    |     |         |
| Seagate Technology           | Mr. Gene Milligan       | 1   |    |     |         |
| Sony Corp. of America        | Mr. Robert L. Simpson   | 1   |    |     |         |
| Storage Technology Corp.     |                         |     |    |     | 1       |
| Sun Microsystems, Inc.       | Mr. Robert N. Snively   | 1   |    |     |         |
| Texas Instruments            | Mr. Richard Mourn       | 1   |    |     |         |
| The JPM Company              |                         |     |    |     | 1       |
| Thomas & Betts               | Mr. Harvey Waltersdorf  | 1   |    |     |         |
| UNISYS                       | Mr. Peter Dougherty     | 1   |    |     |         |
| Western Digital              | Mr. Jeff Stai           | 1   |    |     |         |
| Woven Electronics            | Mr. Doug Piper          | 1   |    |     |         |
| Yamaichi Electronics, Inc.   | Mr. Steve Drake         | 1   |    |     |         |
| Totals:                      |                         | 42  | 0  | 0   | 18 = 60 |

The motion passed 42:0:18. The "as revised" document will be numbered Revision 3.0.



**10.2 Request for new Additional Sense Codes (92-46) [Houlder]**

Gene Milligan moved and George Penokie seconded that 92-046R1 be accepted for inclusion in SCSI-3. The motion passed 29:0.

**10.3 Request for Sequential-Access Density Codes (92-47,83) [Gardner, Washburn]**

Sam Washburn requested additional sequential-access density codes (see 92-083). Both proposals request small blocks of codes for future standardization. The codes assigned to 92-047 are 18h-1Bh. The codes assigned to 92-083 are 1Ch-23h. In the absence of any objection these documents were accepted for inclusion in SCSI-3.

**10.4 Proposal to Support Media Interchange (92-56) [Wilhelm]**

Norm Harris, being new on the job, requested an update on the arguments pro and con on the MI proposal. He stated he would be prepared to address the issues at Harrisburg.

**10.5 Review of new documents**

- 92-084 - Preparing new documents. Several suggested improvements will be made to the document and a revision 1 will be in the next mailing.
- 92-085 - CHANGE INQUIRY Command [Penokie]. Sent to Harrisburg, PA.
- 92-086 - 3.3 volt Implementation [Spence]. Sent to Harrisburg, PA.

**10.6 Agenda for the May X3T9.2 General Working Group**

The following draft agenda was generated for the May X3T9.2 General Working Group meeting in Harrisburg, PA:

1. Revised SCSI-3 project proposals
2. Serial Bus Protocol (P1394) [Smyers]
3. FC-4S Protocol [Snively]
4. Generic Packetized Protocol [Stephens]
5. SCSI-3 Architecture Model [Monia]
6. ATA Extensions - DMA Timing [McGrath]
7. Enhancement of Sequential Access for Medium Changers (92-6) [Jones]
8. Alternate P Cable Connector for SCSI-3 {Monday 5 p.m.}
9. Draft ATA Public Review responses
10. Device Type 0 Support for Media Interchange (92-56) [Wilhelm]

**10.7 IEEE Disk Attach/Scalable Storage Interface (92-098) [Freeman]**

John Lohmeyer stated he had received a letter from Martin Freeman on resolving MAT issues with X3T9.2. John sent a response, asking for a copy of the PAR and stating that this would be discussed at this plenary. John asked for volunteers for drafting a response.

Larry Lamers stated that the next MSC meeting is set for 7:00pm Monday, May 11, 1992 at the Los Gatos Lodge.

Del Shoemaker cited the MAT report. He reported that SPARC is set to vote on DADI next week. He requested the input of X3T9.2 on directions.

Dal Allan cited other industry activity in the memory-mapped interface area.

About 18 folks indicated that they would participate on the DADI project. Del suggested we go for approval at SPARC. A grass roots meeting should also be pursued.

Dal Allan pointed out two errors on the PAR application. One, the statement that MSC is not aware of any standards or projects with a similar scope. Two, the statement on the bottom of the first page that indicates there has been discussions between X3T9.2 and MSC in the development of the PAR.

Dal requested that X3T9.2 ask X3T9 point out to NESCOM that the PAR contains the following errors:

- 1) Scope in conflict with DADI project because it intends to define a disk interface.
- 2) Similar projects exist.
- 3) The PAR does not comply with the MAT strategy.

Bill Spence moved and Stan Sharp seconded that the committee authorize the chairman to draft a response to NESCOM and MSC to express disagreement with the P1285 project and offer counter proposals. The motion passed 31:0:0.

John Lohmeyer will send a letter to Martin Freeman on grass roots efforts, stating that it needs to be an open meeting and not in conflict with other meetings. He will request a target date of May 26, 1992 for an afternoon meeting.

#### **10.8 PR Comments on BSR X3.221-199x, ATA (AT Attachment)**

The comments received were assigned to the next general working group to draft responses.

#### **10.9 Resolution of X3 Negatives on ATA Extensions Project Proposal**

John had drafted response letters to the three X3 negative ballots. The responses were reviewed and the following action was taken:

Donna Pope moved and Dal Allan seconded that X3T9.2 recommend that X3T9 forward the response letters to X3. The motion passed 19:2:0.

#### **10.10 Presentation on SGS-Thomson Serial Link Technology [Crowell]**

Forrest Crowell gave a brief introduction to the DS-Links serial interface. A full presentation is scheduled during the serial working group meeting on Monday evening and at the next general working group in Harrisburg, PA.

#### **11. Review of Action Items**

1. John Lohmeyer will forward the response letters to the X3 negatives on the ATA Extensions Project Proposal to X3T9.
2. Dal Allan will prepare CAM rev 3.0.
3. John Lohmeyer will forward CAM 3.0 to X3T9.
4. John Lohmeyer will draft a letter to MSC on P1285.
5. John Lohmeyer will send a letter to Martin Freeman regarding the "grass roots" meeting.

## 12. Meeting Schedule

The next meeting of X3T9.2 will be June 22-23, 1992 at the Hotel Sofitel Minneapolis (612-835-1900) in Bloomington, Minnesota hosted by StanaTek. The room rates are \$95 single, \$110 double (tax included). The reservation deadline for these rates is May 29, 1992.

The plenary meeting schedule is:

| Date                                           | Location                 | Host      |
|------------------------------------------------|--------------------------|-----------|
| June 22-23, 1992                               | Minneapolis, MN          | Stanatek  |
| August 17-18, 1992                             | Seattle                  | Boeing    |
| October 12-13, 1992                            | Ft. Lauderdale, FL       | Boeing    |
| December 7-8, 1992                             | San Diego, CA            | Vitro     |
| February 15-16, 1993                           | Austin, TX               | Motorola  |
| April 19-20, 1993                              | St. Petersburg Beach, FL | AMP       |
| June 21-22, 1993                               | Minneapolis, MN          | Stanatek  |
| [Locations and hosts below here are tentative] |                          |           |
| August 16-17, 1993                             | Monterey, CA             | SynOptics |
| October 11-12, 1993                            |                          |           |
| December 6-7, 1993                             | San Diego, CA            | Vitro     |

### 12.1 Working Group Schedule

The General Working Group meeting schedule is:

| Date            | Location        | Host    |
|-----------------|-----------------|---------|
| May 18-22, 1992 | Harrisburg, PA  | AMP     |
| Jul 20-24, 1992 | Rochester, MN   | IBM     |
| Sep 21-25, 1992 | Toronto, Canada | Canstar |
| Nov 9-13, 1992  | Sunnyvale, CA   | Amdahl  |

The tentative schedule for the May working group week is (X3T9.2 related meetings are shown with an asterisk):

| Day       | Meeting                           | Times           |
|-----------|-----------------------------------|-----------------|
| Monday    | Small Form Factor                 | 9:00a - 2:00p   |
|           | ATA Extensions                    | 2:00p - 5:00p * |
| Tuesday   | X3T9.2 Working Group [connectors] | 5:00p - 8:00p * |
|           | X3T9.2 General Working Group      | 9:00a - 1:00p * |
|           | SPI Working Group                 | 1:00p - 8:00p * |
|           | (Drivers & Terminators)           |                 |
| Wednesday | FC Fabric                         | 9:00a - 5:00p   |
|           | X3T9.2 General Working Group      | 9:00a - 5:00p * |
|           | Low-cost Fabric Loop              | 5:00p - 8:00p   |
|           | FC Fabric                         | 9:00a - 5:00p   |
| Thursday  | IPI-3 Working Group               | 9:00a - 5:00p   |
|           | SCSI Editors                      | 9:00a - 5:00p * |
|           | FC-PH                             | 9:00a - 5:00p   |
|           | FC-O/LCF-PMD Connectors           | 9:00a - 5:00p   |
| Friday    | Loop Fabric                       | 8:30a - 12:00n  |
|           | FC-PH                             | 8:30a - 2:00p   |
|           | FC-O                              | 8:30a - 2:00p   |

In addition to the above meetings, an ad hoc meeting on the Serial Bus Protocol proposal (\*) was scheduled for May 12-14, 1992 in Colorado Springs hosted by Ed Gardner of Digital.

**12.2 Authorization of Working Group Meetings**

The X3 Secretariat has requested that the various X3 subgroups be more formal about authorizing ad hoc meetings (a.k.a. working groups). Therefore, John added this agenda item to formally authorize working group meetings.

John also noted that the working group meetings are required to operate under the same voting procedures as does X3T9.2 (that is, one vote per organization) and the results of a working group are not binding on the parent committee. This later requirement is why we have traditionally only used non-binding straw polls in working group meetings. Any issue where the voting rules would make a difference is automatically deferred to the plenary group.

John Lohmeyer moved and Chuck Brill seconded that X3T9.2 authorize the meetings listed with an asterisk in agenda item 12.1.

The motion passed unanimously.

**13. Adjournment**

The meeting was adjourned at 6:00 p.m. on Monday April 27, 1992.

## Meeting Attendees -- Enclosure (1)

| Name                       | Status | Organization                  |
|----------------------------|--------|-------------------------------|
| Mr. Robert C. Herron       | A      | 3M Company                    |
| Mr. Wayne Roen             | A      | 3M Company                    |
| Mr. Ken Wolfswinkel        | V      | 3M Company                    |
| Mr. Norm Harris            | P      | Adaptec, Inc.                 |
| Mr. Charles Brill          | P      | AMP, Inc.                     |
| Mr. Bob Whiteman           | A      | AMP, Inc.                     |
| Mr. J. Michael Evans       | O      | AMP, Inc.                     |
| Mr. Bill Hurdle            | O      | AMP, Inc.                     |
| Mr. C. Edward Reynolds     | S      | AMP, Inc.                     |
| Mr. Ken Schreder           | S      | AMP, Inc.                     |
| Mr. David McAdoo           | V      | AMP, Inc.                     |
| Mr. Russell Mozer          | V      | AMP, Inc. (consultant)        |
| Mr. Ken Talemtime          | O      | Amphenol                      |
| Mr. Jeff Rosa              | P      | Amphenol Interconnect         |
| Mr. Michael Wingard        | A      | Amphenol Interconnect         |
| Mr. Richard M. Ross        | O      | Amphenol/Spectra-strip        |
| Mr. Jan V. Dedek           | P      | Ancot Corp.                   |
| Mr. Scott Smyers           | P      | Apple Computer                |
| Mr. Bill Infield           | P      | Archive Corp.                 |
| Mr. David Hess             | P      | Berk-Tek, Inc.                |
| Mr. Eric Lawrence          | O      | Brand-Rex Company             |
| Mr. Christian Mollard      | O      | BULL Systems                  |
| Mr. Edward Hrvatin         | P      | Burndy Corp.                  |
| Mr. Clifford E. Strang Jr. | O      | BusTek                        |
| Mr. Rich Mizia             | O      | C&M Corp.                     |
| Mr. Kurt Witte             | P      | Ciprico Inc.                  |
| Mr. Edward Haske           | P      | CMD Technology                |
| Mr. Michael Lazar          | P      | Connector Ind. Consulting Gr  |
| Mr. Stephen R. Cornaby     | P      | Conner Peripherals            |
| Mr. Wayne Sanderson        | P      | Control Data Corp.            |
| Mr. Michael Smith          | V      | Dallas Semiconductor          |
| Mr. Bill Anderson          | O      | DDK Electronics, Inc.         |
| Mr. Charles Monia          | P      | Digital Equipment Corp.       |
| Mr. Ralph Weber            | A      | Digital Equipment Corp.       |
| Mr. John A. Gallant        | A      | Digital Equipment Corp.       |
| Mr. Edward A. Gardner      | A      | Digital Equipment Corp.       |
| Dr. William Ham            | A      | Digital Equipment Corp.       |
| Mr. Del Shoemaker          | L      | Digital Equipment Corp.       |
| Mrs. Patricia Moore        | S      | EIE, America, Inc.            |
| Mr. Skip Jones             | A      | Emulex Corp.                  |
| Mr. I. Dal Allan           | P      | ENDL                          |
| Mr. D. W. Spence           | A      | ENDL Associates               |
| Mr. Edward Lappin          | P      | Exabyte Corp.                 |
| Mr. Stan Sharp             | P      | Foxconn International, Inc.   |
| Mr. Bob Thornton           | O      | Fujitsu Components of Amer.   |
| Mr. Robert Liu             | P      | Fujitsu Computer Products, Am |
| Mr. Steve Caron            | P      | Furukawa Electric America     |
| Ms. Chris Borgers          | A      | Future Domain                 |
| Mr. Jeffrey L. Williams    | P      | Hewlett Packard Co.           |
| Mr. Kurt Chan              | A      | Hewlett Packard Co.           |
| Mr. Russell Smith          | A      | Hewlett Packard Co.           |
| Mr. Denis Chaves           | O      | Hewlett Packard Co.           |
| Mr. Stewart Wyatt          | V      | Hewlett Packard Co.           |
| Mr. Oscar Kornblum         | P      | Hirose Electric U.S.A.        |
| Mr. Norman Marshburn       | V      | Hirose Electric U.S.A.        |
| Dr. Sam Karunanithi        | P      | Hitachi Micro Systems, Inc.   |
| Mr. David McFadden         | P      | Honda Connector               |
| Mr. Tom Kulesza            | O      | Honda Connector               |
| Mr. George Penokie         | P      | IBM Corp.                     |

|                        |   |                              |
|------------------------|---|------------------------------|
| Mr. Gary R. Stephens   | A | IBM Corp.                    |
| Mr. Otis Greene        | O | IBM Corp.                    |
| Mr. Thomas H. Newsom   | S | IBM Corp.                    |
| Mr. Jay H. Neer        | S | IBM Corp.                    |
| Mr. Larry Grasso       | S | IBM Corp.                    |
| Mr. Jim Kopec          | V | IBM Corp.                    |
| Mr. Kevin R. Pokorney  | O | Intellistor, Inc.            |
| Mr. David Lawson       | P | Interphase Corp.             |
| Mr. Geoff Barton       | P | Iomega Corp.                 |
| Mr. David H. Shaff     | P | JAE                          |
| Mr. Robert Bellino     | P | Madison Cable Corp.          |
| Ms. Donna Pope         | P | Maxoptix Corp.               |
| Mr. Lawrence J. Lamers | P | Maxtor Corp.                 |
| Mr. Bob Masterson      | P | Methode Electronics, Inc.    |
| Mr. John Cannon        | O | Methode Electronics, Inc.    |
| Mr. Raymond C. Yule    | P | Micropolis Corp.             |
| Mr. Ken Erickson       | A | Micropolis Corp.             |
| Mr. Jim McGrath        | A | Molex Inc.                   |
| Mr. Max Bassler        | O | Molex Inc.                   |
| Mr. John Lopata        | O | Molex Inc.                   |
| Mr. William E. Burr    | P | Nat. Inst. of Stnds. & Tech. |
| Mr. John Lohmeyer      | P | NCR Corp.                    |
| Mr. David Steele       | S | NCR Corp.                    |
| Mr. Bruce Anderson     | P | NEC Technologies Inc.        |
| Mr. Bruce DeBree       | P | NEK Cable, Inc.              |
| Mr. Stephen F. Heil    | P | Panasonic Technologies, Inc  |
| Mr. Marc Shoquist      | V | Paramax                      |
| Mr. James McGrath      | P | Quantum Corp.                |
| Mr. Gene Milligan      | A | Seagate Technology           |
| Mr. Forrest Crowell    | P | SGS-Thomson Microelectronics |
| Mr. Mike Holt          | O | Silicon Systems              |
| Mr. Robert L. Simpson  | P | Sony Corp. of America        |
| Mr. Roger Cummings     | A | Storage Technology Corp.     |
| Mr. Gregory Green      | O | Stratus Computer             |
| Mr. Robert N. Snively  | P | Sun Microsystems, Inc.       |
| Mr. Richard Mourn      | O | Texas Instruments            |
| Mr. Richard J. Krass   | P | The JPM Company              |
| Mr. Leonard Dore       | A | The JPM Company              |
| Mr. Harvey Waltersdorf | P | Thomas & Betts               |
| Mr. Peter Dougherty    | P | UNISYS                       |
| Mr. Arlan P. Stone     | A | UNISYS                       |
| Mr. Martin M. Freed    | V | USAF ASD/WPAFB               |
| Mr. Bryan Morgan       | V | USAF ASD/WPAFB               |
| R. Mark Myton          | V | USAF ASD/WPAFB               |
| Mr. Sam Washburn       | O | Wangtek                      |
| Mr. Jeff Stai          | P | Western Digital              |
| Mr. Doug Piper         | P | Woven Electronics            |
| Mr. Steve Drake        | P | Yamaichi Electronics, Inc.   |
| Mr. Saied Zangenehpour | P | Zenith Data Systems          |

108 People Present

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



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## X3T9.2 Document Register - Enclosure (3)

X3T9.2/92-1                      Date:                      Author: J. Lohmeyer [1/21/92]  
Desc: X3T9.2 1991 Annual Report  
Res:

X3T9.2/92-2                      Date: 12/10/91 Author: SC 25/WG 4 Secretariat [1/21/92]  
Desc: Standardization Activities in ISO/IEC JTC 1/SC 25/WG 4  
Res:

X3T9.2/92-3                      Date: 12/10/91 Author: SC 25/WG 4 Secretariat [1/21/92]  
Desc: Draft Report of 2nd Mtg of WG 4 held in Bremen, Germany 9/30-10/2 1991  
Res:

X3T9.2/92-4                      Date: 1/10/92 Author: B. Spence [1/21/92]  
Desc: Cable Impedance Revisited  
Res:

X3T9.2/92-5                      Date: 1/15/92 Author: Lamers/ Lohmeyer [1/21/92]  
Desc: Houston Working Group Minutes  
Res:

X3T9.2/92-6                      Date:                      Author: K. Jones [1/21/92]  
Desc: Enhancement of Sequential Access Command Set for Medium Changers  
Res:

X3T9.2/92-7 Rev 1                  Date: 2/13/92 Author: V. Novak [3/24/92]  
Desc: Proposed SCSI Identifier Symbols  
Res: Accepted for SCSI-3 SPI at 2/92 plenary meeting

X3T9.2/92-8                      Date: 1/11/92 Author: W. Burr [1/21/92]  
Desc: An Introduction to X3T9 and I/O Interface Standards  
Res:

X3T9.2/92-9                      Date: 1/7/92 Author: L. Lamers [1/21/92]  
Desc: ltr to Mr. Mori responding to his questions in 91-170  
Res:

X3T9.2/92-10                      Date: 1/13/92 Author: T. Hanan [1/21/92]  
Desc: PCMCIA IDE Host Interface Implementation Guide  
Res:

X3T9.2/92-11                      Date: 1/13/92 Author: C. Runowicz [1/21/92]  
Desc: DMA data transfer method as outlined in AT Attachment  
Res:

X3T9.2/92-12                      Date: 1/14/92 Author: J. Williams [1/21/92]  
Desc: CA Clearing Commands  
Res:

X3T9.2/92-13                      Date: 1/14/92 Author: J. Williams [1/21/92]  
Desc: Conflicting Statement on CA and Queue Suspension  
Res:

X3T9.2/92-14                      Date: 1/10/92 Author: E. Gardner [1/21/92]  
Desc: Previewing Linked Commands in SCSI-3  
Res:

X3T9.2/92-15                      Date: 1/10/92 Author: E. Gardner [1/21/92]  
Desc: The Meaning of Linked Commands in SCSI-3  
Res:

X3T9.2/92-16                      Date: 1/13/92 Author: C. Mosley [1/21/92]  
Desc: SCSI-3 Connector Presentation  
Res:

X3T9.2/92-17                      Date: 1/14/92 Author: F. Samela [1/21/92]  
Desc: Signal Line Increased Current Kicker  
Res:

X3T9.2/92-18                      Date: 1/16/92 Author: L. Lamers [1/21/92]  
Desc: DADI Working Group Minutes 1/13/92  
Res:

X3T9.2/92-19 Rev 1                  Date: 1/24/92 Author: Panokic/ Lamers [1/21/92]  
Desc: SCSI-3 Queuing Working Group Minutes 1/13/92  
Res:

X3T9.2/92-20                      Date:                      Author: B. Spence [1/21/92]  
Desc: SPI Working Group Minutes 1/14/92  
Res:

X3T9.2/92-21                      Date:                      Author: J. Lohmeyer [1/21/92]  
Desc: SPP Working Group Minutes 1/15/92  
Res:

X3T9.2/92-22                      Date: 1/17/92 Author: Panokic/ Mosley [1/21/92]  
Desc: SPI Connector Contact Working Group Minutes 1/15/92  
Res:

X3T9.2/92-23                      Date: 1/1/92 Author: M. Mitoma [1/21/92]  
Desc: Serial Storage Architecture  
Res:

X3T9.2/92-24                      Date: 1/15/92 Author: I. Judd [1/21/92]  
Desc: A Serial Link for Storage Subsystems (presentation)  
Res:

X3T9.2/92-25                      Date: 11/15/91 Author: I. Judd [1/21/92]  
Desc: A Serial Link for Storage Subsystems (paper)  
Res:

X3T9.2/92-26                      Date: 12/12/91 Author: C. Butterworth [1/21/92]  
Desc: Serial Storage Architecture SSA-0 (Transport Layer) Ver 1.0  
Res:

X3T9.2/92-27                      Date: 12/12/91 Author: C. Butterworth [1/21/92]  
Desc: Serial Storage Architecture SSA-1 (Disk Order Level) Ver 1.0  
Res:

X3T9.2/92-28                      Date: 1/14/92 Author: M. Jordan [1/21/92]  
Desc: Fast Single Ended SCSI Terminator Concept -- Active Negation Emulator  
Res:

X3T9.2/92-29                      Date: 1/18/92 Author: Dal Allan [1/21/92]  
Desc: Translation of IPI-3 Command Queuing to SCSI Language  
Res:

X3T9.2/92-30                      Date: 1/31/92 Author: L. Lamers [3/24/92]  
Desc: SPP Architectural Meeting January 27-28, 1992  
Res: n.a.

X3T9.2/92-31                      Date: 2/5/92 Author: Smyers, Neer, & Newsom [3/24/92]  
Desc: Alternate P-Cable Connector for SCSI-3  
Res: On General WG Agenda 3/18/92 17:00

X3T9.2/92-32                      Date: 2/11/92 Author: K. Chan [3/24/92]  
Desc: Fast SCSI Timing Problems and Solutions  
Res: Assigned to SPI WG

X3T9.2/92-33                      Date: 2/7/92 Author: S. Smyers [3/24/92]  
Desc: Proposed Requirements for SCSI-3 devices which use P1394 Physical I/F  
Res: To be included in Annex of SBP document

X3T9.2/92-34                      Date: 2/14/92 Author: J. McGrath [3/23/92]  
Desc: DMA Meeting at HP-PCG on 1/24/92  
Res: On ATA Extensions agenda for 3/18/92 14:00

X3T9.2/92-35 Rev 2                  Date: 4/28/92 Author: G. Penokio [5/14/92]  
Desc: SCSI-3 Alt 1 Connector Requirements  
Res: Accepted for SCSI-3 Parallel Interface

X3T9.2/92-36                      Date: 2/18/92 Author: B. Spence [3/24/92]  
Desc: Termination of Reserved Lines  
Res:

X3T9.2/92-37                      Date: 2/18/92 Author: B. Ham [3/24/92]  
Desc: Specifications for SPI Transceivers  
Res:

X3T9.2/92-38                      Date: 2/13/92 Author: F. Opreescu [3/24/92]  
Desc: Proposal for Glitch Immunity Specification  
Res:

X3T9.2/92-39                      Date: 2/12/92 Author: A. Crick [3/24/92]  
Desc: Microsoft concerns with the CAM XPT/SIM document  
Res:

X3T9.2/92-40                      Date: 2/21/92 Author: Lamers/ Lohmeyer [3/24/92]  
Desc: X3T9.2 Meeting #98 Minutes -- February 17, 1991  
Res: n.a.

X3T9.2/92-41                      Date: 2/22/92 Author: Lamers/ Penokio [3/24/92]  
Desc: Austin Queuing Working Group Minutes  
Res: n.a.

X3T9.2/92-42                      Date: 12/30/91 Author: R. Gibson [3/24/92]  
Desc: International Participation Fee  
Res:

X3T9.2/92-43                      Date: 2/18/92 Author: Spence/ Lamers [3/24/92]  
Desc: SPI Working Group Minutes 2/18/92  
Res: n.a.

X3T9.2/92-44                      Date:                      Author: J. Tecco [3/24/92]  
Desc: May 1992 Working Group Announcement  
Res:

X3T9.2/92-45 Rev 1                  Date: 4/27/92 Author: C. Monia [5/14/92]  
Desc: Introduction to Packetized SCSI  
Res:

X3T9.2/92-46 Rev 1                  Date: 3/20/92 Author: G. Houlder [3/24/92]  
Desc: Request for new Additional Sense Codes  
Res: On Apr '92 WG agenda

X3T9.2/92-47                      Date: 3/12/92 Author: E. Gardner [3/24/92]  
Desc: Request for Sequential-Access Density Codes  
Res:

X3T9.2/92-48                      Date: 3/12/92 Author: J. McGrath [3/24/92]  
Desc: Molex Pin Chamfer Proposal  
Res:

X3T9.2/92-49                      Date: 3/18/92 Author: C. Mosley [3/24/92]  
Desc: SCSI-3 Connector  
Res:

X3T9.2/92-50                      Date: 3/17/92 Author: B. Spence [3/24/92]  
Desc: 8-bit Drives Within a 16-bit SCSI System  
Res:

X3T9.2/92-51                      Date: 3/18/92 Author: T. Newsom [3/24/92]  
Desc: Presentation on Alternative Ribbon Connector for SCSI-3  
Res:

X3T9.2/92-52                      Date: 9/4/90 Author: T. Newsom [3/24/92]  
Desc: IBM Procurement Specification on Mini Ribbon D Shell Connector  
Res:

X3T9.2/92-53            Date: 2/18/91   Author: T. Newsom   [3/24/92]  
Desc: Burndy Specification on Microshield (tm) Receptacle  
Res:

X3T9.2/92-54            Date:            Author: T. Newsom   [3/24/92]  
Desc: AMP Specification on Receptacle Assembly, 80 Position, Champ .050  
Res:

X3T9.2/92-55            Date: 1/31/90   Author: T. Newsom   [3/24/92]  
Desc: Molex Specification on Mini Ribbon Shell Shielded Connector  
Res:

X3T9.2/92-56            Date: 3/12/92   Author: A. Wilhelm   [3/24/92]  
Desc: Proposal to modify Device Type 0 to support Media Interchange  
Res:

X3T9.2/92-57            Date: 3/18/92   Author: T. Debiec   [3/24/92]  
Desc: Proposal for SCSI Cable Performance Specification  
Res:

X3T9.2/92-58            Date: 3/13/92   Author: C. Ghest   [3/24/92]  
Desc: Statement re US patent of Glitch remover circuit  
Res:

X3T9.2/92-59            Date: 2/17/92   Author: B. Ham   [3/24/92]  
Desc: Electrical Impacts of SCSI Hot Plugging  
Res:

X3T9.2/92-60            Date: 3/18/92   Author: J. Lohmeyer   [3/24/92]  
Desc: ltr re PCMCIA/ATA Proposal, dated February 24, 1992  
Res:

X3T9.2/92-61            Date: 3/18/92   Author: T. Asami   [3/24/92]  
Desc: SCSI ACK Net with Wired-OR Driver  
Res: Presented at 3/92 SPI WG Meeting

X3T9.2/92-62            Date: 3/17/92   Author: K. Chan   [3/24/92]  
Desc: Differential Fast Synchronous Timing  
Res: Presented at 3/92 SPI WG Meeting

X3T9.2/92-63            Date: 3/13/92   Author: J. Blagaila   [3/24/92]  
Desc: Integral Peripherals 88 Pin IDE Pinout  
Res:

X3T9.2/92-64            Date: 12/18/91   Author: Hanan & Abrahamsson   [3/24/92]  
Desc: PCMCIA IDE Drive Auto Select Proposal  
Res:

X3T9.2/92-65            Date: 3/3/92   Author: S. Shah   [3/24/92]  
Desc: Support for Greater than 528MB ATA Drive  
Res:

X3T9.2/92-66            Date: 1/28/92   Author:   [3/24/92]  
Desc: IBM 9333 SCSI Mapping  
Res:

X3T9.2/92-67            Date: 1/29/92   Author: J. Best   [3/24/92]  
Desc: SSA-PH Appendix Daisy Chain  
Res:

X3T9.2/92-68            Date: 3/16/92   Author: B. Herron   [3/24/92]  
Desc: 3M High-Density .050" "D" Ribbon Style Interconnect System  
Res:

X3T9.2/92-69            Date: 3/13/92   Author: B. Bellino   [3/24/92]  
Desc: Madison Cable Impedance Variations  
Res:

X3T9.2/92-70            Date: 3/18/92   Author: L. Lamers   [3/24/92]  
Desc: ATA Extensions Working Group Minutes 3/18/92  
Res:

X3T9.2/92-71            Date: 3/18/92   Author: Lamers/ Lohmeyer   [3/24/92]  
Desc: X3T9.2 General Working Group Minutes 3/18-18/92  
Res:

X3T9.2/92-72            Date: 3/17/92   Author: Lamers/ Spence   [3/24/92]  
Desc: SPI Working Group Minutes 3/17/92  
Res:

X3T9.2/92-73            Date: 2/27/92   Author: D. Shoemaker   [3/24/92]  
Desc: ltr to Don Laughry re IEEE MSC/X3T9 Memory Attach Strategy  
Res:

X3T9.2/92-74            Date: 3/18/92   Author: S. Shah   [3/24/92]  
Desc: Public Review Comment on AT Attachment (BSR X3.221)  
Res:

X3T9.2/92-75            Date: 3/18/92   Author: J. Gallant   [3/24/92]  
Desc: Creating a TIB for SCSI-2 Tag Queuing working model.  
Res:

X3T9.2/92-76            Date: 3/18/92   Author: G. Penokie   [3/24/92]  
Desc: Connector Contact Working Group Meeting Minutes 3/18/92  
Res:

X3T9.2/92-77            Date: 4/13/92   Author: John Lohmeyer   [5/14/92]  
Desc: Response to M. Freeman of MSC on his 4/8/92 letter  
Res:

X3T9.2/92-78            Date: 4/8/92   Author: M. Freeman   [5/14/92]  
Desc: Letter to John Lohmeyer on MAT/MS P1265  
Res:

X3T9.2/92-79 Rev 0 Date: 4/24/92 Author: Charles Monia [5/14/92]  
Desc: SCSI-3 Architecte Model (SAM)  
Res:

X3T9.2/92-80 Date: 4/27/92 Author: F. Crowell [5/14/92]  
Desc: DS-Links Technical Information  
Res:

X3T9.2/92-81 Date: 4/8/92 Author: Lynn Barra [5/14/92]  
Desc: Transmittal of Public Review Comment #1 ATA  
Res:

X3T9.2/92-82 Date: 4/7/92 Author: Lynn Barra [5/14/92]  
Desc: Approval of Project Proposal for AT Attachments Extensions  
Res:

X3T9.2/92-83 Date: 4/27/92 Author: S. Washburn [5/14/92]  
Desc: Request for Sequential Access Density Codes  
Res: Accepted for SCSI-3

X3T9.2/92-84 Rev 1 Date: 4/24/92 Author: L. Lamers [5/14/92]  
Desc: Preparing Documents for Committee Mailings  
Res:

X3T9.2/92-85 Date: 4/27/92 Author: G. Penokle [5/14/92]  
Desc: CHANGE INQUIRY Command  
Res:

X3T9.2/92-86 Date: 4/27/92 Author: D.W. Spence [5/14/92]  
Desc: SCSI Implementation in a 3.3 volt Environment  
Res:

X3T9.2/92-87 Date: 4/27/92 Author: D.W. Spence [5/14/92]  
Desc: Key Changes Proposed for the SPI Standard  
Res:

X3T9.2/92-88 Date: 4/23/92 Author: J. Gallant [5/14/92]  
Desc: Two Changes for the CAM document  
Res: Accepted for CAM rev 3.0

X3T9.2/92-89 Date: 4/13/92 Author: D. Rundle [5/14/92]  
Desc: Status of IEC 488 Standards Efforts  
Res:

X3T9.2/92-90 Date: 4/27/92 Author: F. Crowell [5/14/92]  
Desc: Presentation Foils of Serial DS-Link Technology  
Res:

X3T9.2/92-91 Date: 4/8/92 Author: J. McGrath [5/14/92]  
Desc: Tolerance Analysis of P-cable Connection  
Res:

X3T9.2/92-92 Date: 4/28/92 Author: J. Lohmeyer [5/14/92]  
Desc: Letter to M. Freeman on Grass Roots  
Res:

X3T9.2/92-93 Date: 4/27/92 Author: B. Ham [5/14/92]  
Desc: SCSI-3 Connector Framework  
Res:

X3T9.2/92-94 Date: 3/13/92 Author: I. Dal Allan [5/14/92]  
Desc: Information Package on 1988 Connector Decision  
Res:

X3T9.2/92-95 Date: 4/29/92 Author: L. Lamers [5/14/92]  
Desc: Minutes of the April 1992 X3T9.2 Plenary Meeting  
Res:

X3T9.2/92-96 Date: 4/27/92 Author: T. Asami [5/14/92]  
Desc: Pin Capacitance of a SCSI Controller LSI  
Res:

X3T9.2/92-97 Date: 4/27/92 Author: B. Ham [5/14/92]  
Desc: Requirement for Glitch Free Power Up/Down  
Res:

X3T9.2/92-98 Date: 4/29/92 Author: M. Freeman [5/14/92]  
Desc: IEEE P1285 PAR  
Res:

X3T9.2/92-99 Date: 4/13/92 Author: I. Dal Allan [5/14/92]  
Desc: Connector Agenda Items  
Res:

X3T9.2/92-100 Date: 5/4/92 Author: D.W. Spence/L. Lamers [5/14/92]  
Desc: Minutes of April 1992 SPI meeting  
Res:

X3T9.2/92-101 Date: 5/1/92 Author: I. Dal Allan [5/14/92]  
Desc: Project Proposal for SCSI-3 Generic Packetized Protocol  
Res:

X3T9.2/92-102 Date: 5/1/92 Author: I. Dal Allan [5/14/92]  
Desc: Project Proposal for SCSI-3 Serial Bus Protocol  
Res:

X3T9.2/92-103 Date: 5/1/92 Author: I. Dal Allan [5/14/92]  
Desc: Project Proposal for SCSI-3 Fiber Channel Protocol  
Res:

X3T9.2/92-104 Date: 5/1/92 Author: I. Dal Allan [5/14/92]  
Desc: Project Proposal for SCSI-3 Architecture Model  
Res:

X3T9.2/92-105 Date: 5/1/92 Author: I. Dal Allan [5/14/92]  
Desc: Project Proposal for SCSI-3 Core Commands  
Res:

X3T9.2/92-108 Date: 5/1/92 Author: I. Dal Allan [5/14/92]  
Desc: Project Proposal for SCSI-3 Block Commands  
Res:

X3T9.2/92-107 Date: 5/1/92 Author: I. Dal Allan [5/14/92]  
Desc: Project Proposal for SCSI-3 Stream Commands  
Res:

X3T9.2/92-108 Date: 5/1/92 Author: I. Dal Allan [5/14/92]  
Desc: Project Proposal for SCSI-3 Graphic Commands  
Res:

X3T9.2/92-109 Date: 5/1/92 Author: I. Dal Allan [5/14/92]  
Desc: Project Proposal for SCSI-3 Medium Changer Commands  
Res:

X3T9.2/92-110 Date: 4/13/92 Author: D. Saythe [5/14/92]  
Desc: IDE (ATA) Document Changes  
Res: