To: Membership of X3T9.2
From: Lawrence J. Lamers/John B. Lohmeyer
Date: August 28, 1992
Subject: Minutes of X3T9.2 Plenary Meeting #101

Agenda -- X3T9.2 Meeting #101
Bellevue, WA -- August 17-18, 1992

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       8.10   SCSI-3 Serial Bus Protocol (SBP) Status [Gardner]
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9.   Old Business
       9.1   Enhancement of Sequential Access for Medium Changers (92-006) [Jones]
       9.2   Unitized Connector (92-139) for SCSI-3 [Cornaby]
       9.3   PR Comments on BSR X3.221-199x, ATA (AT Attachment)
       9.4   SCSI-3 Queuing Issues (92-143R3) [Penokie]
       9.5   Active Negation Minimum Current Level (92-159 item 1.5)
       9.6   Synchronization Status and Errors (92-130) [Robison]
       9.7   Proposal to add a disconnect unconditionally after command phase (92-133)
                [Smyers]
       9.8   Response to 92-111 (ASC/ASCQ for data compression) (92-134) [Williams]
       9.9   Hot Plugging Requirements for SPI (92-137) [Ham]

Results of Meeting

1.   Opening Remarks

John Lohmeyer, the Chair, called the meeting to order at 9:00 a.m., Monday August 17, 1992. He thanked Buzz Rigsbee of Boeing Computer Services for hosting the meeting.

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 additions:

      9.13 Connector Testing (92-155) [Mosley]
      9.14 Annex D of SPI [Spence]
      10.10 Change INQUIRY Mode Page (92-092R3) [Penokie]

Dal Allan polled the group on the efficacy of having assigned time slots for topics. John Lohmeyer noted a problem with time slots when Ed Gardner did not show up for the assigned time to discuss SBP. Most folks were of the opinion that time slots were a good idea even though there are occasional disruptions.

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 termination of one organization for nonattendance (see 3.1), the X3T9.2 voting membership is now at 61 organizations down from 62 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.

3.1   Roll Call of Members in Jeopardy

The Chair said he had sent jeopardy letters to 8 people from 2 organizations: Advanced Micro Devices and The JPM Company. Due to a cockpit problem, the letter had incorrectly shown The JPM Company as attending the February meeting and missing the April meeting; in fact, the opposite was true but they are still in jeopardy.

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.

A representative was present from Advanced Micro Devices, but no one was present from The JPM Company. This organization was changed to observer status.

4.   Approval of Minutes - June Meeting Bloomington, MN (92-144 R0)

The minutes were approved as written.

5.   Document Distribution

John Lohmeyer said that the committee mailing had gone out just before 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 must be sent so as to be received by noon on Thursday, September 10, 1992. Documents received after this date will go into a subsequent 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.

The current document register is enclosure (3).

5.1   Lecture on Document Preparation for Mailings

Larry Lamers reminded the committee of the requirements for document submission to be included in the committee mailing. Since X3T9.2 meets its CBEMA document archiving requirements by including CBEMA on the mailing list, documents included in the mailing must be suitable for microfilming. This means that high-quality, single-sided originals with adequate margins and proper identification must be submitted.   Document X3T9.2/92-84 R1 contains the list of requirements for submissions.   John Lohmeyer agreed to distribute this document to the SCSI Reflector.

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:

> At its last meeting X3T9 passed a motion "that X3T9 take the appropriate actions to withdraw Project 788D for HIPPI Memory Interface (HIPPI-MI), and to withdraw the ISO NP for HIPPI-MI" by a vote of 21:0:0:7. The IR sent a letter, X3T9/IR92008, to the X3 Secretariat requesting that the appropriate steps to   discontinue any   work on the international version of this project be taken. At its June meeting X3T9 learned that the NP's   had encountered procedural problems. As a consequence X3T9 passed a motion "that X3T9 recommend that the US National Body approve the submission of the following New Projects to JTC 1: HIPPI-FP; HIPPI-LE; HIPPI-SC; and FC-PH" by a vote of 17:1:0:10. The negative balloter indicated that the vote was not in opposition to the New Projects but in opposition to two motions by the same committee to take the same action. The IR sent a letter X3T9/IR92009 to the X3 Secretariat that again requested the secretariat to forward these proposed old New Projects through official channels. It also requested that as a part of the forwarding action please take whatever additional steps are appropriate to comply with the latest interpretation of the procedural requirements.

> X3T9/IR910016   dated   12/19/92 stated "The   enclosed   SCSI-2 Revision 10H X3T9/89-042 (X3.131-199X) is being submitted as the basis for SC 25 to issue a DIS. The submittal of revision H was reviewed and approved by X3T9 as the TAG to SC 25/WG 4. The revised dpANS document, X3T9\89-042 Rev H, is about to go through its second public review." This action was in compliance with the strategy to synchronize the domestic and international interface standards by submission of proposed Committee Drafts to ISO/IEC at about the same time as the X3 Public Review. The action requested in the reference letter was taken. Unfortunately the letter of transmittal from the US National Body did not include a statement as to why the document was being provided to SC 25. X3T9/IR92010   to   the X3 Secretariat requesting   that   the appropriate steps be taken to have a replacement letter sent stating the appropriate equivalent of "SCSI-2 Revision 10H was previously transmitted with the intention that it be used as the basis for SC 25 to issue a DIS."

> X3T9/IR92002   and X3T9/92009 requested the   appropriate processing of a NP for Fibre Channel (FC) Physical and Signaling Interface (PH). An information copy of the subject document X3T9/91-062 Rev 2.2 was transmitted by X3T9/IR92004   dated 4/21/92. Since then X3T9 has completed addressing X3T9 letter ballot comments on the subject document and forwarded a revised document to X3 for further processing. As a   consequence X3T9/IR92011   requested that the X3 Secretariat take   the appropriate steps necessary to transmit Fibre Channel (FC) Physical and Signaling

Interface (PH) draft 3.0 dated 6/16/92 through appropriate channels to SC 25 as an information copy pending the approval of the related NP. Upon approval of the NP it should be the basis for a committee draft.

At its last meeting X3T9 passed a motion "that X3T9 submittal of SMT Rev 7.2 to the X3 Secretariat as a contribution for a CD LB to JTC 1". Please take the appropriate steps necessary to transmit FDDI SMT Revision 2.2 dated 6/25/92 through appropriate channels to SC 25 for the purpose of a CD Letter Ballot.

The IR sent X3T9/IR92013 thanking Juergen Schwandt for his inquiry of 7 August which alerted us to the notice JTC 1 N 2011 the Letter Ballot for several NP's had been withdrawn. It informed him that except for HIPPI-MI there is no technical reason to defer work on these standards. It speculated that there was some sort of administrative reason for the withdrawal.

6.2   IT8 [Lohmeyer]

John Lohmeyer had nothing new to report. The next IT8 meeting is in early September.

6.3   Fibre Channel [Allan]

Dal Allan reported. The FC-PH is now at X3 and is going out for public review. The discussion on the FC-4 for serial SCSI focused on details; with a distant desire to get below interface and fiddle with the sequences exhibited. IEEE 802 requires in order delivery while fiber channel does not. The IPI FC-4 is essentially finished after a small war over management services. The fiber channel loop document has been reviewed in detail. The confusion in the fabric document due to the port definitions has been clarified in the current revision.

6.4   Small Form Factor Industry Group [Allan]

Dal Allan reported orally and provided the following written report:

Status of SFF   8-15-92

As a result of the SFF Committee meeting in July, the SFF document has been updated to Rev 1.9 to reflect changes made during that meeting.

There were a few replies to letters mailed to all hard disk manufacturers asking them to comply with the ANSI patent policy for form factor patents. Conner responded that it will not license according to ANSI patent policy and Seagate responded that it would. Hewlett Packard provided the dimensions of the 1.3" disk drive.

Seagate and Integral proposed alternate side mounts and screw sizes for 1.8" drives. This action was referred to the 1.8" SSWG, which is also responsible to define the X-Y-Z dimensions for all possible connector configurations:

 - 68-pin horizontal (PCMCIA type)
 - 50-pin vertical and horizontal header
 - 68-pin high-density vertical and horizontal header

Some corrections were made to the 50-pin ATA Pinouts.

A common definition of the 68-pin ATA Pinouts has been agreed to. Hewlett Packard proposed an alternative protocol which is a hybrid of ATA and PCMCIA operation. This activity was referred to the 1.8" SSWG.

A proposal to re-constitute the SFF Committee as an ongoing activity to act as a focal point for issues which require rapid industry action is to be voted on by the membership. One of the new provisions is to publish agreed-upon commonality between a number of vendors should industry consensus not be possible. Although some issues may not be related to form factor, it was felt the SFF name had industry recognition and should be retained.

6.5   IEEE P1394 [Smyers]

Scott Smyers reported. IEEE P1394 Rev 5.2 is released. The next meeting is Tuesday, September 15, 1992 at the Red Lion Hotel in Colo Spgs. Contact Ken Stewart at NCR Microelectronics for further details (719-596-5795).

6.6   IEEE P1285 Status

John Lohmeyer announced that Dennis Pak (Apple Computer) had been appointed as the liaison from the IEEE P1285 group by Martin Freeman.

Dennis Pak reported:

> The P1285 group is developing an interface standard for a high latency non-volatile environment. The intent is for direct attachment; no cabling system is used. The key features are: storage element extension to existing memory; byte addressable; one-controller with multiple slaves; an isochronous service similar to P1394; and architecture based on the P1212 standard.

> Martin Freeman has requested that X3T9.2/DADI appoint a liaison to P1285. John Lohmeyer made a call for volunteers and requested they contact him.

> A grass roots meeting took place on July 13, 1992 at Santa Clara University. The results of this meeting were distributed on the grass roots reflector. Folks desiring to be on this reflector should contact "teener@apple.com". The next grass roots meeting is scheduled for the week of September 28, 1992 at Quantum in Milpitas, CA.

> A co-located meeting with X3T9.2 is planned for November during the X3T9.2 working group week. [Note: This has not been finalized with X3T9.2]

> A reflector is planned for P1285. Interested folks should contact Dennis Pak at 408-974-4874 or "dennis.pak@applelink.apple.com".

John Lohmeyer said Martin Freeman had sent him an e-mail announcing the next P1285 meeting:

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                    Meeting Announcement
              IEEE P1285 Scalable Storage Interface

The next meeting of P1285 is on Friday, September 4, from 2:00-5:00
PM at the Apple Computer City Center 4 Building, 20450 Stevens Creek
Bld, Cupertino, CA. City Center 4 is at the corner of Stevens Creek
and DeAnza Blvd.
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6.7   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 Conner Peripherals patent on power management, and a Maxtor patent on spindle synchronization.

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.

7.   Review of Old Action Items

1.   John Lohmeyer will request X3T9 to request an ISO NP for ATA. **Complete.**
2.   John Lohmeyer will submit four project proposals (SBP, GPP, FCP, SAM) to X3T9. **Complete.**
3.   Larry Lamers will incorporate 92-129 and 92-007 into SPI. **Carried over**.
4.   Dal Allan will draft responses to ATA public review comments. **Carried over**.
5.   John Lohmeyer will arrange a grass roots meeting with the IEEE MSC P1285 group. **Complete.**
6.   John Lohmeyer will investigate alternative scheduling for the June 1993 Plenary meeting. **Complete.**

8.   Working Group and/or Project Status Reports

8.1   SCSI General Working Group (X3T9.2/92-158) [Lamers]

Larry Lamers reported on the last working group meeting. See 92-158 for details.

8.2   SPI Working Group (X3T9.2/92-159) [Spence]

Bill Spence reported on the last SPI meeting. See 92-159 for details. Bill also stated that in his opinion SPI is commencing an approach to convergence. The plan of action is to have an editing session on Thursday of the next X3T9.2 working group week; a final SPI working group meeting on Wednesday of the next plenary week; and a forwarding motion at the December X3T9.2 plenary meeting. There will not be a SPI working group meeting during September, 1992.

8.3   SCSI-2 Status [Lamers]

The ISO editor's comments have been incorporated as far as the Project Editor intends to. John Lohmeyer has revised the figures. A draft of the modified document will be sent back through channels as soon as the Project Editor recovers the files from yet another data corruption failure in Wordperfect.

The Project Editor requested volunteers to proofread document at next plenary meeting.

John Lohmeyer presented a draft proposal for a response to the comment received from U.S. Design. A letter ballot will be conducted to approve the response.

8.4   SCSI Common Access Method (CAM)

CAM, Rev 3.0, was forwarded to X3 at the June X3T9 meeting for the public review process. The status of the SPARC compliance review was not known.

8.5   AT Attachment Status (ATA)

ATA collected 3 formal public review comments and four informal comments. These have substantially been addressed and will be finalized at next ATA working group meeting.

8.6   SCSI-3 Architecture Model (SAM) Status [Monia]

Charles Monia reported that the three major issues from the last meeting --linked commands, a model for domain, addressing LUN -- are addressed in revised document.

8.7   SCSI-3 Parallel Interface (SPI) Status [Lamers]

Bill Spence made copies of revision 6 available to folks at the meeting. The Project Editor noted that figures were not correctly placed within the document due to problems with Wordperfect editing figures. A revision 7 of the document will be included in the next mailing.

8.8   SCSI-3 Interlocked Protocol (SIP) Status [Lamers]

No change.

8.9   SCSI-3 Generic Packetized Protocol (GPP) Status [Stephens]

Gary Stephens was not present for this topic.

8.10   SCSI-3 Serial Bus Protocol (SBP) Status [Gardner]

Ed Gardner was not present. John Lohmeyer noted that he had spoken with Ed on Thursday afternoon and that Ed planned to arrive later in the meeting. Ed had expected to have a revised SBP document with him.

8.11   SCSI-3 Fiber Channel Protocol (FCP) Status [Snively]

Bob Snively not present. The designated alternate, Paul Ramsey, was also not present.

8.12   SCSI-3 Command Set (SCS) Status [Lamers, Stephens]

No activity. The project proposals are not yet finalized, but Larry and John hope to have them in time for the next meeting.

8.13   Directly-Addressable Device Interface (DADI) [Smyers]

Scott Smyers presented a revision of his Common Unit Architecture document. The project title or the document title need to be adjusted. A no vote was received from HP on the project proposal. This no vote will not stop approval of the project, but requires a response.

Dal Allan moved and Jeff Stai seconded that X3T9 recommend that the project proposal not be changed and the HP comment be rejected because X3T9 is opposed to development of a high-latency storage interface outside of X3T9. The motion carried unanimously.

John Lohmeyer, Dal Allan, and Larry Lamers accepted an action to draft a response letter for cosideration by X3T9.

> Chair's note: X3T9 approved a substantially revised version of this letter at their Friday Aug 21 meeting.

8.14   ATA Extensions [Lohmeyer]

No new information.

9.   Old Business

9.1   Enhancement of Sequential Access for Medium Changers (92-006) [Jones]

Kurt Chan gave an update on Kevin Jones' proposal. A significant architectural change was proposed to make media movement part of the common device model. Embedding the changer function in the primary commands makes this easy to do and eliminates extra SCSI IDs, and LUN's.

MOVE MEDIUM, READ ELEMENT STATUS are proposed primary commands and INQUIRY data reports changer function capability. New ASC/ASCQ codes are also included in the proposal.

9.2   Unitized Connector (92-139) for SCSI-3 [Cornaby]

Steve Cornaby presented the latest revision of the unitized connector with pin definitions for the feature portion of the connector.

There was a consensus on pin assignments, but not on the connector. There was a desire for the pin assignments to be normative. The subject was remanded to the working group.

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

John Lohmeyer presented a foil summarizing the comments received on ATA:

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Cmnt  X3T9.2
  #   Doc #   Author        Company   Comments
----  ------  ------------  --------  -------------------------------------
  1   92-81   Roland        Novell    1) Need method to determine whether
              Whatcott                drive does read/write multiple
                                      correctly.
                                      2) Need method to determine the
                                      read/write multiple block size.
  2   92-132  Saied         Zenith    Proposed REST/RESUME Functions for ATA
              Zangenehpour
  3   92-140  Shishir Shah  Western   Support for > 528 MByte thru Logical
                            Digital   Block Addressing
      92-110  Dave Smyth    Intel     Proposed ATA Timing Changes
      92-142  Jim McGrath   Quantum   Need Download Microcode Command and
                                      need 3.3 volt operation.
      92-152  Mehran        Emulex    Proposed DMA Timing Changes
              Ramezani
      (none)  Gene          Seagate   UNC and CORR should not have "V" for
              Milligan                Read Long command in Table 8-2.
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Dal Allan prepared a 3.1 revision incorporating the comments received.

9.4   SCSI-3 Queuing Issues (92-143R3) [Penokie]

Due to the absence of Ed Gardner on Monday, this topic was moved from Tuesday afternoon to Monday afternoon. George Penokie presented his latest queuing proposal.

There was a discussion on terminology issues: volatile vs non-volatile terminology does not convey the essence of what is needed for ordered tags.

Jim McGrath (Quantum) argued for an archaic queue implementation with write caching. This changes the effect of ORDERED tags. Switching the effect could be the subject of a mode parameter to have synchronized writes vs stacked writes. The latter would allow sequential ordered write commands without a command complete in between.

A straw poll revealed that 5 folks favored a mode page, none favored creating a new tag, and 10 were for no change.

George Penokie moved and Jim McGrath seconded that a mode parameter be included for selecting between the way ordered tags operate (write concatenation vs time stamping). The motion failed 2:12.

George will take one more pass on the proposal with the objective being to take a vote for inclusion in SCSI-3 at the next plenary meeting.

9.5   Active Negation Minimum Current Level (92-159 item 1.5)

The July SPI working group had agreed to recommend that 92-148R2 be accepted for the SPI document. Emulex voiced concerns over the minimum current requirements (7 Ma at 2 volts) which were already in SPI and were repeated in the 92-148R2 document. More discussion may be required on the actual numbers, but 92-148R2 was mostly a clarification of the existing document.

Bill Spence moved and Bill Ham seconded that single-ended active negation V_{OH} provisions in section 7.1.2 in 91-010R6 (which incorporated 92-148R2) be accepted with the I_{OH} value at 3.0 volts changed to 20 ma. The motion carried 14:0.

The question arose of should terminators be allowed 25 pF of capacitance? Bill Ham wanted to revise the wording so that it would be clearer that the terminators define the ends of the bus.

The terminator folks were requested to supply Bill Spence with information regarding the capacitance of their devices.

9.6   Synchronization Status and Errors (92-130) [Robison]

No discussion -- on the September working group agenda.

9.7   Proposal to add a disconnect unconditionally after command phase (92-133) [Smyers]

Several additional comments were made during the discussion, most directed at getting the wording proper. Scott will revise the document to include these.

9.8   Response to 92-111 (ASC/ASCQ for data compression) (92-134) [Williams]

A revised proposal aligned with George Penokie's ASC/ASCQ definitions and accommodating Peter Dougherty's revised document was available.

Norm Harris moved and Peter Dougherty seconded that 92-111 R1 and 92-134 R1 be included in SCSI-3. The motion passed without dissent.

9.9   Hot Plugging Requirements for SPI (92-137) [Ham]

Bill Ham presented his wording for hot plugging.

Bill Ham moved and Bill Spence seconded that 92-137 be incorporated into the SPI document. The motion passed without dissent.

9.10   Single SCSI Cable for all forms of SCSI (92-138R1) [Ham]

This topic was concluded at a previous meeting and a section on how to build a cable suitable for both single-ended and differential SCSI applications will be included in SPI.

9.11   Conformance Testing [Rich Bailly]

Rich Bailly made a presentation on conformance testing. He defined what conformance testing is, the documentation required, and a flow chart on the process. See document 92-168 for details.

Del Shoemaker warned that while at this time the conformance testing is only a draft policy it is likely to become a requirement in the near future and so it should not be dismissed. It was pointed out that SCSI-2, SCSI-3, and ATA would need significant work if they were to follow the policy as stated.

Gary Stephens volunteered to submit his prior work on conformance testing for chapters 1-7 of SCSI-2 as an example of what needs to be done.

9.12   Terminator Current Source Limits: Should vs. Shall [Spence]

Gene Milligan moved and Skip Jones seconded that 'should' be restored to 'shall' in section 7.1.1 item b. The motion carried 13:3.

There was unanimous consensus to change the reserved lines to "shall be open" for SCSI-3.

9.13   Connector Testing (92-155) [Mosley]

George Penokie explained that IEEE 1152.6 ceased to exist and the wording that was in it is supplied for inclusion in SPI.

George Penokie moved and Bill Ham seconded that 92-155 be included as a replacement for the IEEE 1152.6 reference.
The motion carried - 14:0.

9.14   Annex D of SPI [Spence]

Bill Spence requested that all comments on this annex be sent to him in order to find the common denominator.

10.   New Business

10.1   Forwarding Motions on new SCSI-3 Project Proposals

John and Larry had not found time to draft the remaining project proposals. This item was carried over to the October meeting.

10.2   Review of new documents

All documents were reviewed under the appropriate agenda items.

10.3   Agenda for the September X3T9.2 General Working Group

The following draft agenda was generated for the September X3T9.2 General Working Group meeting in Toronto:

ATA Extensions MONDAY 2:00-8:00
        PR Comments on BSR X3.221-199x, ATA (AT Attachment)

SCSI-3 Command Set (SCS) TUESDAY 9:30-11:00
        Enhancement of Sequential Access for Medium Changers (92-006) [Stephens]
        Synchronization Status and Errors (92-130) [Robison]
        Change inquiry page (92-092R3) [Penokie]

SCSI-3 Architecture Model (SAM) TUESDAY 11:00-1:00

Serial Protocol Topics TUESDAY 2:00-8:00
        SCSI-3 Serial Bus Protocol (SBP)
        Directly-Addressable Device Interface
        SCSI-3 Fiber Channel Protocol (FCP)
        SCSI-3 Generic Packetized Protocol (GPP)

General WG Topics WEDNESDAY 9:00-1:00
        SCSI-3 Queuing Issues (92-143R0) [Penokie]
        Proposal to add a disconnect unconditionally after command phase (92-133) [Smyers]
        Response to 92-111 (ASC/ASCQ for data compression) (92-134) [Williams]
        Conformance Testing [Rich Bailly]
        ASC/ASCQ for Power-On Reset [Houlder] (92-162)
        SCSI Common Access Method (CAM-2)

SPI Topics WEDNESDAY 2:00-6:00
        Unitized Cable Connector (92-139) for SCSI-3 [Cornaby]
        Active Negation Minimum Current Level (92-159 item 1.5)
        Hot Plugging Requirements for SPI (92-137) [Ham]
        Single SCSI Cable for all forms of SCSI (92-138R1) [Ham]
        Terminator Current Source Limits: Should vs. Shall [Spence]
        SFF Submission for SPI Annex [Allan]
        Active Termination Requirements [Wallace]

Connector Requirements [Penokie]

10.4   SCSI Mapping to SSA (92-145) [Scheible]

John Scheible made a presentation on SSA. He stated that SSA is designed to coexist with other serial interfaces. SSA is tailored for storage subsystems, while fiber channel is used between systems and P1394 is designed for desktop applications.

A number of adaptations have been included in the latest version of SSA to make it more easily align with SCSI-2 and other serial interfaces.

An industry group is being formed to develop standards level documentation. The first SSA meeting is scheduled for 9/16/92 at IBM in San Jose, CA. Contact John Scheible for details. Follow-on meetings are planned for 10/26/92 and 01/12/93.

10.5   ASC/ASCQ for Power-On Reset [Houlder] (92-162)

Gerry Houlder requested an ASC/ASCQ for power-on reset. It was suggested that "reset" be deleted so that it is clear that it is a power-on, and not a reset. George Penokie suggested that the other reset conditions be specified. The power on, bus reset, bus reset message, are to be included in a revised proposal.

10.6   SCSI-3 Architecture Model [Monia]

Charles gave a presentation on the latest SAM thinking. The first issue discussed is the domain assumptions. He assumed that third-party commands will not be in SCSI-3 because there are problems with the fact that initiators may have different views of the domains. The question is, "Are domains initiator-centric or homogenous?"

The consensus was that third-party operations are needed and should be allowed within a domain. The domain boundaries are vendor specific, however Ed Gardner expressed a strong desire to limit the domain to the same physical bus. One or more domains may exist. Within a domain homogeneity exists which means third party I/O processes can be executed. Crossing domains implies that homogeneity may not exist and a third-party I/O process may not work. There still is an open issue on how to specify third-party commands.

Ed Gardener offered the following meta-definitions:
        "architecture" - define in SAM;
        "transport specific" - defined in SIP, SBP, FCP, GPP;
        "implementation specific" - defined by systems integrator.

Charles asked about addressable entities and the form of the address.
Is a target-lun identification retained within the 32-bit identifier? This immediately roused the 32- vs. 64-bit folks. It was decided to first settle the addressable entity issue then the form of address. There was some consensus to preserve a four-level hierarchy. The common address mapping discussion was remanded to be continued on reflector.

There was little time left for discussion on linked commands, but Charles posed his two main issues:
        - is there implicit reservation?
        - a command that fails needs to be defined within the architecture.

10.7   Serial Protocol Issues [Gardner, Smyers, et al]

Ed Gardner gave a sermon on the delivery mechanism for serial interfaces.
The function delivery format is independent of the function. There are multiple schemes under discussion: pointer FIFO, mailbox, and shareable list. He was in favor of a globally unique identifier above the transport with another identifier in the transport layer for routing. The identifier size of 32-bits for LUN's was favored by most folks.

Scott Smyers submitted the revision 1 of CCU architecture with a revised appendix to aid in understanding. CCU represents a shared list delivery scheme. Atomic operations are restricted to a single object (the tail pointer). The enqueing initiator only performs writes to pointers that were previously null which eliminates the need for atomic operations on the head pointer.

Ed Gardner pointed out that interlocked accesses (needed for atomic operations on some buses) to host memory on order of 1 microseconds in 10 years ago are now on the order of 30 microseconds. This seriously affects the performance of pipeline operations.

The points of contention are:
-    Use of SCSI CDB's or 8-byte pointer with 4-byte length to describe target address space.
-    Delivery mechanism is different.

10.8   SFF Submission for SPI Annex [Allan]

John Lohmeyer, recoiling in horror at all the connectors included in the proposal, suggested that the working group review the proposal prior to plenary consideration.

10.9   Active Termination Requirements [Wallace]

Not discussed -- on September working group agenda.

10.10   Change INQUIRY Mode Page (92-092R3) [Penokie]

George Penokie presented a resurrected version of the CHANGE INQUIRY DATA command reconstituted as a mode page. This proposal includes a way to return to the default state.

Several problems were identified with the current proposal. Variable length pages are an anathema to many folks and returning an offset value of zero is inconclusive. A 64-byte fixed length page was suggested; if the parameter list length is zero there is no information available.

11.   Review of Action Items

1)   John Lohmeyer will send document preparation information out on the SCSI reflector.
2)   Larry Lamers will include grass roots meeting minutes in the mailing.
3)   John Lohmeyer will draft and/or plagiarize a patent notice for working draft documents.
4)   Larry Lamers and John Lohmeyer will complete the project proposals for the SCSI-3 command sets.
5)   Larry Lamers will conduct a letter ballot on approving the response to the SCSI-2 public review comment.
6)   Larry Lamers will conduct letter ballots on approving the command set project proposals.

12.   Meeting Schedule

The next meeting of X3T9.2 will be October 12-13, 1992 at the Crown Sterling Suites Hotel (305-527-2700) in Ft. Lauderdale, Florida hosted by BOEING Computer Services. The room rates are $85.00 plus 9% tax. The reservation deadline for these rates is September 13, 1992.

The plenary meeting schedule is:

```
Date                 Location                 Host
-------------------- ------------------------ ---------------------
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   Colo Spgs, CO            NCR
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
-------------------- ----------------- ------------------------------
Sep 21-25, 1992        Toronto, Canada   Canstar
Nov 9-13, 1992         Sunnyvale, CA     Amdahl
Jan 11-15, 1993        Sunnyvale, CA     Tandem
Mar 15-19, 1993        Orange County, CA   Emulex
May 17-21, 1993        Santa Fe, NM      Los Alamos
Jul 19-23, 1993      Boston, MA          DEC
Sep 13-17, 1993        Poughkipsee, NY    IBM
Nov 8-12, 1993       Colo Spgs, CO       NCR
```

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

```
Day        Meeting                            Times
---------  --------------------------------   -------------
Monday     Small Form Factor                  9:00a -  1:00p
           ATA Extensions                     2:00p -  8:00p (*)
           IPI-3                              9:00a -  5:00p
Tuesday    X3T9.2 General Working Group       9:00a -  8:00p (*)
           IPI-3                              9:00a -  5:00p
           FC-LT                              1:00p -  8:00p
Wednesday  X3T9.2 Working Group               9:00a -  8:00p (*)
           FC-PH Services                     9:00a -  5:00p
Thursday   SCSI Editors                       9:00a -  5:00p (*)
           FC-PH (FC-4's for IP, FP, SB,      9:00a -  5:00p
                 IPI, SCSI) & state machines
           FC-0                              9:00a -  5:00p
Friday     FC-PH General                      8:30a -  2:00p
           FC-0                              8:30a -  2:00p
```

In addition there is a SPI working group meeting scheduled for Wednesday, October 14, 1992 9:00a - 5:00p following the plenary meeting for a full review of the SPI document.

12.2   Authorization of Working Group Meetings

John 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 Larry Lamers seconded that X3T9.2 authorize the meetings listed with an asterisk in agenda item 12.1 and the SPI working group for Wednesday, October 14, 1992. The motion passed unanimously.

13.   Adjournment

The meeting was adjourned at 6:00 p.m. on Tuesday August 18, 1992.

Meeting Attendees -- Enclosure (1)

```
              Name                   Status      Organization
----------------------------- ------ ------------------------------
Mr. Robert C. Herron             A     3M Company
Mr. Norm Harris                  P     Adaptec, Inc.
Mr. Harvey Scott                 O     ADIC
Mr. Erik Falk                    O     ADIC
Mr. Jim Kubinec                  O     Advanced Micro Devices
Mr. Shahnad Nadershahi           O     Amdahl Corp.
Mr. Charles Brill                P     AMP, Inc.
Mr. Jeff Rosa                    P     Amphenol Interconnect
Mr. Jan V. Dedek                 P     Ancot Corp.
Mr. Scott Smyers                 P     Apple Computer
Mr. Dennis Pak                   O     Apple Computer
Mr. Bill Infield                 P     Archive Corp.
Mr. Tom Debiec                   P     Berk-Tek, Inc.
Mr. Schreck Philippe             O     BULL S.A.
Mr. Bob Gannon                   O     C&M Corp.
Ms. Janet Schank                 V     Central Data
Mr. Michael Lazar                P     Connector Ind. Consulting Gr
Mr. Stephen R. Cornaby           P     Conner Peripherals
Mr. Wayne Sanderson              O     Consultant
Mr. Michael Smith                S     Dallas Semiconductor
Mr. Tom Hunt                     V     Dallas Semiconductor
Mr. David G. Moore               O     Data General Corp.
Mr. Charles Monia                P     Digital Equipment Corp.
Dr. William Ham                  A     Digital Equipment Corp.
Mr. John A. Gallant              A     Digital Equipment Corp.
Mr. Ralph Weber                  A     Digital Equipment Corp.
Mr. Edward A. Gardner            A     Digital Equipment Corp.
Mr. Skip Jones                   P     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. 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. Denis Chaves                 V     Hewlett Packard Co.
Mr. George Penokie               P     IBM Corp.
Mr. Gary R. Stephens             A     IBM Corp.
Mr. John P. Scheible             O     IBM Corp.
Mr. Giles Frazier                S     IBM Corp.
Mr. David Lawson                 P     Interphase Corp.
Mr. Geoff Barton                 P     Iomega Corp.
Mr. Dwayne Edling                O     Laser Magnetic Storage Intl
Mr. Robert Bellino               P     Madison Cable Corp.
Mr. William Hahn                 O     Martin Marietta
Ms. Donna Pope                   P     Maxoptix Corp.
Mr. Lawrence J. Lamers           P     Maxtor Corp.
Mr. Thomas Su                    V     Maxtor Corp.
Mr. Bob Masterson                P     Methode Electronics, Inc.
Mr. William E. Burr              P     Nat. Inst. of Stnds. & Tech.
Mr. John Lohmeyer                P     NCR Corp.
Mr. Stephen F. Heil              P     Panasonic Technologies, Inc
Mr. Jack Guedj                   V     Raytheon
Mr. Satwinder S. Mangat          A     Ricoh Corporation
Mr. Gene Milligan                A     Seagate Technology
Mr. Gerald Houlder               A     Seagate Technology
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Meeting Attendees -- Enclosure (1)

```
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------------------------------ ------ ------------------------------
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Mr. Stephen G. Finch             O     Silicon Systems
Mr. Daniel E. Moczarny           O     Silicon Systems, Inc.
Mr. Robert L. Simpson            P     Sony Corp. of America
Mr. Dean Wallace                 O     Texas Instruments
Mr. Alan Wetzel                  O     Texas Instruments
Mr. Harvey Waltersdorf           P     Thomas & Betts
Mr. Scott Roland                 A     Thomas & Betts
Mr. Alan Ebright                 O     Toshiba America, Inc.
Mr. Chuck Duquette               V     U.S. Design
Mr. Peter Dougherty              P     UNISYS
Mr. Arlan P. Stone               A     UNISYS
Mr. Rich Bailly                  V     Vitro Corp.
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, ATC
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75 People Present

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

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                    Aug 28, 1992 - 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 Rev 1    Date: 7/16/92  Author: K. Jones  [9/15/92]
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: Penokie/Lamers  [1/21/92]
Desc: SCSI-3 Queuing Working Group Minutes 1/13/92
 Res:

X3T9.2/92-20         Date: 1/14/92  Author: B. Spence  [1/21/92]
Desc: SPI Working Group Minutes for January 1992
 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: Penokie/ 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:
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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 Queueing 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 3/16/92 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. P. McGrath [3/23/92]
Desc: DMA Meeting at HP-PCG on 1/24/92
 Res: On ATA Extensions agenda for 3/16/92 14:00

X3T9.2/92-35 Rev 2   Date: 4/28/92 Author: G. Penokie [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. Oprescu [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/Penokie [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 for February 1992
 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: 3/16/92 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: 3/16/92 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, 60 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: 3/16/92 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: 3/16/92 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 Rev 1   Date: 5/15/92 Author: J. Blagaila [7/15/92]
Desc: Integral Peripherals 68 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 Rev 1   Date: 5/15/92 Author: S. Shah [7/15/92]
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: 3/16/92 Author: L. Lamers [3/24/92]
Desc: ATA Extensions Working Group Minutes 3/16/92
 Res:

X3T9.2/92-71   Date: 3/18/92 Author: Lamers/Lohmeyer [3/24/92]
Desc: X3T9.2 General Working Group Minutes 3/16-18/92
 Res:

X3T9.2/92-72   Date: 3/17/92 Author: Lamers/Spence [3/24/92]
Desc: SPI Working Group Minutes for March 1992
 Res:

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

X3T9.2/92-74 Rev 1   Date: 3/18/92 Author: S. Shah [9/15/92]
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: 3/16/92 Author: G. Penokie [3/24/92]
Desc: Connector Contact Working Group Meeting Minutes 3/16/92
 Res:

X3T9.2/92-77   Date: 4/13/92 Author: John Lohmeyer [5/14/92]
Desc: Response to M. Freeman of MSC on his 4/6/92 letter
 Res:

X3T9.2/92-78   Date: 4/6/92   Author: M. Freeman [5/14/92]
Desc: Letter to John Lohmeyer on MAT/MSC P1265
 Res:

X3T9.2/92-79 Rev 3   Date: 8/15/92 Author: Charles Monia [9/15/92]
Desc: working draft of the 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: 4/6/92   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 Attachements Extensions
 Res:

X3T9.2/92-83 Rev 2   Date: 5/4/92   Author: S. Washburn [7/15/92]
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 Rev 3   Date: 7/31/92 Author: G. Penokie [9/15/92]
Desc: Change Inquiry Mode Page
 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 48B 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 Rev 2   Date: 6/22/92 Author: B. Ham [7/15/92]
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 Rev 1   Date: 5/14/92 Author: Lamers/Lohmeyer [5/14/92]
Desc: Minutes of X3T9.2 Plenary Meeting #99
 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: Spence/Lamers [5/14/92]
Desc: SPI Working Group Minutes for April 1992
 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:

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X3T9.2/92-105        Date: 5/1/92   Author: I. Dal Allan [9/15/92]
Desc: Project Proposal for SCSI-3 Core Commands
 Res:

X3T9.2/92-106        Date: 5/1/92   Author: I. Dal Allan [9/15/92]
Desc: Project Proposal for SCSI-3 Block Commands
 Res:

X3T9.2/92-107        Date: 5/1/92   Author: I. Dal Allan [9/15/92]
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. Smythe [5/14/92]
Desc: IDE (ATA) Document Changes
 Res:

X3T9.2/92-111 Rev 1   Date: 7/27/92  Author: Peter Dougherty [9/15/92]
Desc: Additional ASC/ASCQ Codes for Data Compression
 Res: Accepted for SCSI-3 at August 92 plenary

X3T9.2/92-112        Date: 5/5/92   Author: Scott Smyers [5/14/92]
Desc: Proposal for Alternate 68 Position P Connector
 Res:

X3T9.2/92-113        Date: 5/5/92   Author: John A. Gallant [5/14/92]
Desc: April 28 SCSI-2 Queuing TIB Working Group Meeting Minutes
 Res:

X3T9.2/92-114        Date: 5/7/92   Author: Kurt Chan [5/15/92]
Desc: Transceiver skew recommendations
 Res:

X3T9.2/92-115        Date: 5/7/92   Author: Kurt Chan [5/15/92]
Desc: Cable length requirements
 Res:

X3T9.2/92-116 Rev 1   Date: 5/18/92  Author: Charles Monia [7/15/92]
Desc: Pacetized SCSI System Models
 Res:

X3T9.2/92-117        Date: 5/18/92  Author: D. W. Spence [7/15/92]
Desc: Fast SCSI Stubs Dimensions & Specifications Format
 Res:

X3T9.2/92-118        Date: 4/27/92  Author: Robert Herron [5/15/92]
Desc: 3M Presentation on MDR Connector
 Res:

X3T9.2/92-119        Date: 5/14/92  Author: Thomas Newman [7/15/92]
Desc: ATA Extensions Proposal -- ATA 68 Pin Connection
 Res:

X3T9.2/92-120        Date: 5/18/92  Author: John Geldman [7/15/92]
Desc: Mapping the ATA Interface onto thd SFF 68-pin Connector
 Res:

X3T9.2/92-121        Date: 5/14/92  Author: Thomas Newman [7/15/92]
Desc: ATA Command 0 (No Operation) Proposal
 Res:

X3T9.2/92-122        Date: 5/18/92  Author: D.W. Bill Spence [7/15/92]
Desc: Proposal for Additional Annex for SPI Standard
 Res:

X3T9.2/92-123        Date: 5/14/92  Author: Kevin Gingerich [7/15/92]
Desc: Proposed Change to SPI
 Res:

X3T9.2/92-124        Date: 5/15/92  Author: Steve Hunley [7/15/92]
Desc: Proposed Change to SPI
 Res:

X3T9.2/92-125        Date: 5/14/92  Author: I. Dal Allan [7/15/92]
Desc: Letter on Patents to Steve Cornaby
 Res:

X3T9.2/92-126        Date: 5/21/92  Author: L. Lamers [7/15/92]
Desc: Minutes of the X3T9.2 May General Working Group
 Res:

X3T9.2/92-127        Date: 5/21/92  Author: Lamers/Spence [7/15/92]
Desc: SPI Working Group Minutes for May 1992
 Res:

X3T9.2/92-128        Date: 5/27/92  Author: Rich Mizia [7/15/92]
Desc: Raw Cable Impedance and Bend Radius Test Results
 Res:

X3T9.2/92-129        Date: 5/26/92  Author: R. Whiteman [7/15/92]
Desc: P-Cable connector dimension & tolerance study
 Res:

X3T9.2/92-130        Date: 5/29/92  Author: Kyle Robison [7/15/92]
Desc: Sychronization Status & Errors
 Res:
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X3T9.2/92-131 Rev 1   Date: 8/13/92 Author: S. Smyers [9/15/92]
Desc: A Common Command Unit Architecture
 Res:

X3T9.2/92-132   Date: 6/4/92   Author: Lynn Barra [7/15/92]
Desc: Transmittal of Public Review Comment #2 (ATA)
 Res:

X3T9.2/92-134 Rev 1   Date: 8/4/92   Author: Jeffrey Williams [9/15/92]
Desc: Response to 92-111
 Res: Accepted for SCSI-3 at August '92 plenary

X3T9.2/92-133 Rev 1   Date: 7/24/92 Author: Scott Smyers [9/15/92]
Desc: Proposal to add a disconnect unconditionally after command phase
 Res:

X3T9.2/92-135   Date: 7/20/92 Author: Ed Gardner [9/15/92]
Desc: SCSI-3 Serial Bus Protocol (SBP)
 Res:

X3T9.2/92-136   Date: 6/19/92 Author: H. Waltersdorf & S. Roland
[7/15/92]
Desc: Internal Non-Shielded Connectors
 Res:
X3T9.2/92-137   Date: 5/19/92 Author: B. Ham [7/15/92]
Desc: Hot Plugging Requirements for SPI
 Res:

X3T9.2/92-138 Rev 1   Date: 6/23/92 Author: B. Ham [7/15/92]
Desc: Single SCSI cable for all forms of SCSI
 Res:

X3T9.2/92-139 Rev 1   Date: 8/11/92 Author: S. Cornaby [9/15/92]
Desc: Appendix for SPI on Unitized Connector
 Res:

X3T9.2/92-140   Date: 6/10/92 Author: Lynn Barra [7/15/92]
Desc: Transmittal of Public Review Comment #3 (ATA)
 Res:

X3T9.2/92-141 Rev 1   Date: 7/31/92 Author: G. Penokie [9/15/92]
Desc: SCSI-3 Queuing Model
 Res:

X3T9.2/92-142   Date: 6/23/92 Author: J. P. McGrath [9/15/92]
Desc: ATA Public review comments
 Res:

X3T9.2/92-143   Date: 6/23/92 Author: J. P. McGrath [9/15/92]
Desc: Capacitance on SCSI Signal Lines
 Res:

X3T9.2/92-144   Date: 6/25/92 Author: L. Lamers [7/15/92]
Desc: Minutes of X3T9.2 Plenary Meeting #100
 Res:

X3T9.2/92-145   Date: Author: John Scheible [9/15/92]
Desc: SCSI mapping for SSA
 Res:

X3T9.2/92-146   Date: 7/15/92 Author: Lynn Barra [9/15/92]
Desc: Public Review Comment #1 on SCSI-2
 Res:

X3T9.2/92-147   Date: 8/21/92 Author: Del Shoemaker [9/15/92]
Desc: Response to SCSI-2 Public Review Comment #1
 Res:

X3T9.2/92-148 Rev 2   Date: 7/21/92 Author: D. Steele [9/15/92]
Desc: Active Negation Driver Requirements for SPI
 Res:

X3T9.2/92-149   Date: Author: John Geldman [9/15/92]
Desc: Demand Mode DMA ATA
 Res:

X3T9.2/92-150   Date: Author: Tom Debiec [9/15/92]
Desc:
 Res:

X3T9.2/92-151   Date: 7/17/92 Author: Mehran Raezani [9/15/92]
Desc: Two new commands for ATA
 Res:

X3T9.2/92-152   Date: 7/20/92 Author: Mehran Ramezani [9/15/92]
Desc: DMA Timing Changes In ATA
 Res:

X3T9.2/92-153   Date: 7/18/92 Author: Edward A. Gardner [9/15/92]
Desc: Comments on Blind-pluggable Connector
 Res:

X3T9.2/92-154   Date: 8/15/92 Author: J. Gallant [9/15/92]
Desc: Extensions to the Common Access Method (CAM-2)
 Res:

X3T9.2/92-155   Date: 7/21/92 Author: C. Mosley [9/15/92]
Desc: Connector Requirements
 Res: Accepted for inclusion in SCSI-3 August 92.

X3T9.2/92-156   Date: 7/18/92 Author: Florin Oprescu [9/15/92]
Desc: SCSI Termination Sensing Proposal
 Res:

X3T9.2/92-157   Date: 7/22/92 Author: Shashir Shaw [9/15/92]
Desc: LBA address for ATA
 Res:

X3T9.2/92-158   Date: 7/23/92 Author: L. Lamers [9/15/92]
Desc: Minutes of July 1992 General Working Group
 Res:

X3T9.2/92-159   Date: 7/30/92 Author: D.W. Spence [9/15/92]
Desc: SPI Working Group MInutes
 Res:

X3T9.2/92-160   Date: Author: Dean Wallace [9/15/92]
Desc: TI Constant Current Mode Terminator
 Res:

X3T9.2/92-161   Date: Author: Florin Oprescu [9/15/92]
Desc: Termination Sensing Proposal
 Res:

X3T9.2/92-162   Date: 7/31/92 Author: G. Houlder [9/15/92]
Desc: New ASC/ASCQ for Power-on Reset
 Res:

X3T9.2/92-163   Date: 8/18/92 Author: C. Monia [9/15/92]
Desc: Domain Definitions and Linked Commands (SAM)
 Res:

X3T9.2/92-164   Date: Author: J. Williams [9/15/92]
Desc: New Density codes Tape
 Res:

X3T9.2/92-165   Date: 8/18/92 Author: R. Gannon [9/15/92]
Desc: Serial Cable Protypes
 Res:

X3T9.2/92-166   Date: 8/18/92 Author: L. Lamers [9/15/92]
Desc: X3T9.2 Meeting #101 Minutes
 Res:

X3T9.2/92-167   Date: 8/18/92 Author: J. Lohmeyer [9/15/92]
Desc: Proposed SPARC Policy on Conformance Testing
 Res:

X3T9.2/92-168   Date: 8/17/92 Author: J. P. McGrath [9/15/92]
Desc: ATA Download Microcode Command
 Res:

X3T9.2/92-169   Date: 8/18/92 Author: R. Bailly [9/15/92]
Desc: Conformance Testing Presentation
 Res:

X3T9.2/92-170   Date: 8/15/92 Author: D. Allan [9/15/92]
Desc: SFF pinouts for SPI annexes
 Res:

X3T9.2/92-171   Date: 8/18/92 Author: E. Gardner [9/15/92]
Desc: Presentation on SBP at August Plenary
 Res:

X3T9.2/92-172   Date: 8/20/92 Author: L. Lamers [9/15/92]
Desc: Letter to K. McMillan on Letter Ballot Proceedure
 Res:

X3T9.2/92-173   Date: 8/20/92 Author: L. Lamers [9/15/92]
Desc: Letter to K. McMillan on E-mail use
 Res:

X3T9.2/92-174   Date: 8/20/92 Author: M. Freeman [9/15/92]
Desc: Minutes of July 13, 1992 Grass Roots Meeting
 Res: