

Final Agenda -- X3T9.2 Meeting #80  
February 20-21, 1989 -- Austin, TX

1. Opening Remarks
2. Approval of Agenda
3. Attendance and Membership
  - 3.1 Roll Call of Members in Jeopardy
4. Approval of Minutes - December Meeting San Diego, CA (X3T9.2/88-164)
5. Document Distribution
6. Liaison Reports
  - 6.1 ISO
  - 6.2 IT8
  - 6.3 SCSI-2 Common Access Method Committee Report
  - 6.4 Fiber Channel
7. Review of Old Action Items
8. Working Group and/or Project Status Reports
  - 8.1 ESDI
    - 8.1.1 ESDI Synchronized Sector Offset (X3T9.2/89-023)
  - 8.2 Flexible Disk
  - 8.3 SCSI General Working Group (X3T9.2/89-019)
9. Old Business
  - 9.1 Proposed alternative single-ended terminator (X3T9.2/89-4)
  - 9.2 Review of SCSI-2 Draft Document (X3T9.2/86-109 Rev 7)
    - 9.2.1 Vendor ID Registration
    - 9.2.2 Required sense data: 8 or 18 bytes?
    - 9.2.3 Combine ASC and ASCQ into single 16-bit field?
    - 9.2.4 Should field names be first letter caps?
    - 9.2.5 Should REQUEST SENSE command failure clear sense data? (89-024)
    - 9.2.6 SEARCH DATA command transfer length inconsistency (89-025)
    - 9.2.7 READ DEFECT DATA command [Gerry Houlder]
    - 9.2.8 Comments on SCSI-2 (89-30, 31, 32, 33, 34, 35, 37)
  - 9.3 Cable Testing Results (X3T9.2/89-18)
  - 9.4 TERMINATE IMMEDIATE message re-visited (X3T9.2/88-158 Rev 1, 89-7)
10. New Business
  - 10.1 Tape READ underlength detection (X3T9.2/89-021) [Penokie]
  - 10.2 SCSI-2 Forwarding motion (X3T9.2/86-109 Rev 7)
  - 10.3 ESDI Forwarding motion (X3T9.2/87-105 Rev 3)
  - 10.4 Review of new documents
  - 10.5 Agenda for the Milpitas Working Group
11. SCSI-3 Activities
  - 11.1 Autoconfiguration SSWG
12. Review of Action Items
13. Meeting Schedule
  - 13.1 General Working Group Schedule for 1989
  - 13.2 Methods for Support of Future Plenary Meetings
14. Adjournment

X3T9.2 Meeting #80  
February 20-21, 1989 -- Austin, TX

1. Opening Remarks

John Lohmeyer, the chairman, called the meeting to order at 9:00 a.m., Monday February 20, 1989. He thanked Rhonda Alexis-Dirvin of Motorola for hosting the meeting and he also thanked Classic Conferences for arranging the meeting.

As is customary, the attendees introduced themselves. A copy of the X3T9.2 membership list was circulated for attendance and corrections. Copies of the draft agenda and the recent document register were made available to all attendees. Information on X3T9.2 and Pilot Subscription forms were made available for new attendees.

2. Approval of Agenda

The draft agenda was approved with the following additions:

- 9.2.7 READ DEFECT DATA command [Gerry Houlder]
- 9.2.8 Comments on SCSI-2 (89-30, 31, 32, 33, 34, 35, 37)
- 13.2 Methods for Support of Future Plenary Meetings

3. Attendance and Membership

The membership requirements were reviewed. X3 rules permit one vote per organization. An individual from a new organization must attend one plenary meeting as an observer before he/she may apply for voting membership via a letter to the chairman of X3T9.2. The individual may vote at the second plenary meeting. Working group meetings do not count toward attendance requirements.

The chairman stated that since the last meeting the following changes had occurred in the voting membership: Mr. Jim Erickson replaced Mr. Ray Calvin as the Hirose principal. Mr. Oscar Kornblum replaced Mr. Michael Kosmala as the Hirose alternate. Mr. Glen Nance replaced Mr. Tony Lo as the Quantum alternate. Ms. Rita Lin replaced Mr. Lawrence Lamers as the Sony Corporation principal. Mr. Simon Kustedjo replaced Mr. Masayuki Yokoyama as the Sony alternate.

The following voting membership changes occurred during the meeting: Apple Computer has been reinstated as a voting member of X3T9.2. Mr. Harlan Andrews will be the principal and Mr. Jerry Katzung will be the alternate. Mr. Lawrence Lamers replaced Bob Mortensen as the Maxtor principal. ACT Technology was reinstated with Mr. Nathan Lee designated as the principal and Mr. Jerry L. Amstutz as the alternate. Exabyte Corporation became voting members with Mr. Michael Braitberg named the principal and Mr. Bill Duran named the alternate. DDC Pertec Corporation became voting members with Mr. Rick Ehrecke named the principal and Mr. Mike Racelo named the alternate.

At the end of the meeting, the following changes were made to the AT&T

representation: Mr. James Semenak was replaced by Mr. Joe Lawlor as principal and Mr. David Harms was replaced by Mr. Christopher Phea as alternate. Jim Semenak has taken early retirement from his SCSI editing job; X3T9.2 thanks Jim for his dedication in editing Section 9 and later in editing Sections 7 and 8.

Enclosure (1) is the list of attendees at the meeting. Enclosure (2) is the X3T9.2 membership changes since the last minutes and enclosure (3) is the current X3T9.2 membership list.

### 3.1 Roll Call of Members in Jeopardy

The chairman stated that he had sent jeopardy letters to all representatives of the following organizations: Datacopy Corp., DEST Corp., ELCO Corp., Hirose Electric U.S.A., Honeywell Bull, Inc., ICL, JAE, Maxon Systems, Inc., Northern Telecom, Inc., Panduit Corp., Priam Corp., Ricoh Corporation, Storage Technology Corp., Viking Connectors, and Winchester Electronics.

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 the February plenary meeting. Subsequent to sending out the letters, Ed Cieniawa of Panduit called to inform the chairman that he had attended the October 1988 meeting. It was also pointed out to the chairman that Honeywell Bull and Bull Systems are the same organization and therefore are not in jeopardy. The chairman has corrected the errors in his database.

Representatives were present from all of the organizations except: DEST Corp., ELCO Corp., Maxon Systems, Inc., and Winchester Electronics.

These organizations were terminated, that is changed to Observer status. In the case of DEST, where all participants have left the company, the organization was dropped from the committee lists. Winchester Electronics has elected to not participate in 1989 and was dropped from the committee lists.

### 4. Approval of Minutes - December Meeting San Diego, CA (X3T9.2/88-164)

The minutes were approved with no changes.

### 5. Document Distribution

The last mailing was 858 pages. The X3 Secretariat asked the copying service to put the 1989 Pilot Subscription Form in front of the mailing. They did, causing all the front and back pages to be reversed. The chairman expressed his regrets for the inconvenience.

The task of maintaining the subscription database for the X3T9 groups has now been given to Katrina Gray, Standards Secretary, of the X3 Secretariat. Members with subscription problems should deal directly with Ms. Gray who can be reached at (202) 626-5741.

John Lohmeyer requested that all documents for the March mailing be sent to him before March 15, 1989.

Starting now it is a new year and subscriptions must be renewed to continue getting the documents. The document subscription fee for 1989 is \$110 U.S.A. and \$220 overseas.

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

Document	Doc Date	Author	Description of Document
X3T9.2/89-4 Rev 1	1/30/89	P. Boulay	Proposed Single-Ended SCSI Bus Terminator
X3T9.2/89-24	1/24/89	J. Lohmeyer	When not to clear sense data
X3T9.2/89-25	1/26/89	J. Lohmeyer	SEARCH DATA Transfer Length Inconsistency
X3T9.2/89-26	2/6/89	J. McGrath	March 6-8, 1989 SCSI Working Group and CAM Meeting Announcement
X3T9.2/89-30	2/18/89	P. Nitza	Review of SCSI-2 Revision 7
X3T9.2/89-31	2/10/89	B. Pentecost	DA FORMAT UNIT command, IP Modifier
X3T9.2/89-32	2/16/89	P. Bramhall	Comments on SCSI-2 Working Draft Rev 7
X3T9.2/89-33	2/17/89	D. Appleyard	Attention Condition Timing Delays
X3T9.2/89-34	2/17/89	D. Appleyard	No Operation Message
X3T9.2/89-35	2/20/89	D. Davies	Tape Read Overlength Detection w/SILI Bit
X3T9.2/89-37	2/20/89	Boulay/ Pentecost	Medium Changer Element Status Descriptors
X3T9.2/89-38	2/19/89	V. Novak	Preliminary Results of SCSI-2 Cable Testing
X3T9.2/89-39	2/20/89	Rikkonen et. al.	SCSI-2 Cable Testing Summary Report
X3T9.2/89-40	2/17/89	J. Morse	SCSI Cable Test Configurations

Enclosure (4) is the current 1989 document register.

## 6. Liaison Reports

### 6.1 ISO

John Lohmeyer said that Bill Burr had recently sent the final camera-ready original of the ISO SCSI standard (IS 9316:1989) to Keith Brannon, the ISO Editor. Bill had spent hundreds of hours converting the ANSI SCSI standard into the ISO style and format. John read a letter (89-029) that he had sent to Bill on behalf of X3T9.2, thanking Bill for his efforts.

Mr. Milligan was not present to give his report, but he left the following report which the chairman read:

"The IR is providing X3T9 with an updated International Document Register. It lists 24 documents which require some follow-up or reports of closure.



The ISO/IEC JTC 1/SC 13 Secretariat is actively working with the X3T9 project editors and the ISO editorial staff to complete the publication of numerous X3T9 standards.

X3T9 will be discussing the vote on the new ISO work item proposal for FDDI profiles at its meeting Friday. They will also address the Danish request to revise ANSI procedures.

X3T9.5 is planning to address the Japanese comments on 50 micron fiber at its February meeting.

Mr. Milligan intends to ask Mr. Groenke for information on the status of the SC 83 merger and any possible impact upon the upcoming meeting schedule.

A subsequent set of comments on the SCSI DIS has been received from Mr. Mori of UNISYS Japan in 13N491 dated 12/28/88.

A request for comments on an IEC Interconnection for Telesoftware and Teleprinting has been received in 13N492 dated 1/4/89. It does not appear to impinge upon X3T9 activity.

X3 has devised a new classification of documents that can be withheld from committee participants other than international delegates.

The X3T9 IR has sent a letter to X3T9 officers including sub-committees requesting they obtain volunteer candidates for the SC 13 or SC 83 meeting later this year."

SC 25 has been formed to replace ISO SC 13 and IEC SC83. The German Secretariat of SC 13 will be the SC 25 Secretariat. A primary task for SC 25 at the next meeting in Copenhagen, Denmark is to define the scope of the new committee. This meeting is scheduled for September 25-29, 1989.

## 6.2 IT8

The IT8 committee had requested that a reference to their activities be included in SCSI-2. A reference to their work, as well as to Fiber Channel and SCSI-3, was placed in Appendix H, Other SCSI Standardization Activities.

## 6.3 SCSI-2 Common Access Method Committee Report

Dal Allan reported on the January CAM meeting. At that meeting Jerry Armstrong of NCR described the agreed-upon structure. The structure presented is:

## CPU &amp; Operating System

-----	
-----	
+-----+	
OSD Driver	Operating System Dependent Control Block
+-----+	
Transport Module	Transport Control Block
+-----+	
SCSI Interface Module	Common Access Method Control Block
+-----+	
Protocol Hardware	Command Descriptor Block
+-----+	

- The OSD is Operating System Dependent and will contain the references that are necessary to cross the border in and out of the CAM layer.
- The Transport Module contains a truncated form of the CAM Control Block for functions which do not need a SCSI CDB (e.g., CAM configuration).
- The Interface Module manages the CAM Control Block and contains all the information necessary to dispatch a CDB on behalf of the requester.
- The Protocol Hardware is the SCSI host adapter.

There are issues on how pointers should be handled and appropriate addresses (virtual or physical, size, pointer type, etc.). Dal is working on a suitable format for the standardization of the CAM. There are many editing and style rules to publish standards. It is expected that the proposals will be integrated into a working document that is in a standards format after the February meeting.

#### 6.4 Fiber Channel

Dal Allan reported. The most recent working group meeting was held Jan 30, 31. Canstar proposed an implementation based on active hubs and "knock-on-door" dispatching of packets and Grumman proposed a token-ring with features that reduce overhead and ring latency.

Data General described a point-to-point link developed in fiber using 200 Mbaud transmitters and receivers which can attain almost 16 MBs with large blocks. IBM described the list of features needed to run "fast" in an HSC-like extension using single mode fiber for up to 10 km.

Technology presentations were made by Gazelle on the "Hot Rod" parallel to serial (40:1) conversion components. Ancor covered the technology and use of 1 Gbs circuit switches. These look attractive for providing parallel transfer paths for multi-switched environments. Action items taken to be worked on included the criteria for connectors, (IEC is supposed to work closely with the committee on this); and on security, which will be a big issue.

Of concern to all SCSI committee members should be that there is no representation of SCSI needs in the Fiber Channel working group, HSC is well-represented and so too is IPI. Some have even questioned whether SCSI should be supported by the Fiber Channel.

The next Fiber Channel working group meeting is in San Rafael March 20-21. The following meeting will be in Minneapolis sometime in May.

7. Review of Old Action Items

1. Jim Semenak will correct page 7-31 paragraph 3 in SCSI-2 R5 which references a section that does not exist and should contain a description of time ordering of log entries. **Complete.**
2. John Lohmeyer and Larry Lamers will revise the ISO ESDI document to correct the cover page, to include the figures, and to correct the statement concerning transfer rate reporting requirements. **Completed by Dal Allan.**
3. John Lohmeyer will correct the wording concerning byte ordering in section 4, delete the [] note in section 5 and include Jeff Stai's figure. **Complete.**
4. Paul Boulay will develop an appendix on single-ended terminators. **Carried over.**
5. Paul Boulay will add the READ LONG command to the CD-ROM command set. **Complete.**
6. Paul Boulay will write an implementors note on restoring mode parameters following a third-party release. **Complete.**
7. Jeff Stai will develop cabling recommendations. **Complete.**
8. Jeff Stai will add the WRITE SAME command to section 15. **Complete.**

8. Working Group and/or Project Status Reports

8.1 ESDI

Dal Allan provided John Lohmeyer with ESDI Version 3 for the mailing. This document incorporates the formal and informal public review comments into the ISO-style version of ESDI. A letter from X3T9 to NCR summarizes the changes made as a result of the NCR comment. NCR has informed the X3 Secretariat that ESDI Version 3 satisfactorily addresses their comment (X3T9.2/89-027).

8.1.1 ESDI Synchronized Sector Offset (X3T9.2/89-002, -023)

A document from Kiyotake Kumazawa of Hitachi (89-002) was briefly reviewed during the SCSI general working group meeting in January. It was favorably received and as a result, Dal Allan has submitted a document (89-023) detailing the changes he believes are desirable to support the sector offset in the ESDI document. This change was incorporated in ESDI version 3.

## 8.2 Flexible Disk

John Lohmeyer reported that the revised Flexible Disk standard has been published and is available from ANSI for \$14. It is known as X3.80-1988. This agenda item will be dropped from future agendas.

## 8.3 SCSI General Working Group (X3T9.2/89-019 Rev 1)

Jeff Stai hosted a working group meeting January 9-11 in Costa Mesa, CA. There were 39 attendees. Most of the meeting was spent reviewing an interim revision of SCSI-2 designated Rev 6a. This document was not distributed outside the working group because it was a partial document and has been superseded by Revision 7 which was in the mailing.

This was a good, productive meeting. It is the first time that some sections of the document have been reviewed page-by-page. Many helpful comments were made and the document has been improved considerably as a result.

Pete Bramhall of Hewlett Packard submitted approximately 9 proposals all related to sequential-access devices and most related to helical scan implementations of sequential-access devices. Most of these were at least partially accepted. One, introducing a new command, was placed in the queue for SCSI-3.

The TERMINATE IMMEDIATE message was again brought up for discussion along with the autosense proposal which had previously been placed in SCSI-2 and later deleted. The working group felt that some form of the TERMINATE IMMEDIATE message (later re-named TERMINATE I/O PROCESS) may be desirable, but they were generally opposed to adding autosense to SCSI-2 (see agenda item 9.4).

Revised wording concerning REQUEST SENSE polling was accepted and included in SCSI-2 Rev 7.

## 9. Old Business

### 9.1 Proposed alternative single-ended terminator (X3T9.2/89-4)

Paul Boulay made a presentation for termination based on a Linear Technology voltage regulator. The proposal maintains positive noise margins at 2.0 volts, which the older 220/330 termination does not. The noise margins are even less if impedances are based on the exhibited reflection properties in cables. Dennis O'Niel of Linear Technology (408-432-1900 ext 322) provide the LT1086 voltage regulator information. A fixed voltage low-dropout regulator would work marvelously, however such a part is not available.

Paul has developed an outline for a proposed appendix on termination.

Amphenol agreed to provide six prototypes of external terminators for the persons doing the cable evaluations.

## 9.2 Review of SCSI-2 Draft Document (X3T9.2/86-109 Rev 7)

Larry Lamers and John Lohmeyer met in Wichita the week after the January working group meeting to assemble revision 7. The other editors contributed their sections via the SCSI bulletin board. Larry and John spent 150 man-hours working on the document that week. They had not finished with all the known editorial problems when the deadline came for the mailing.

In particular, the section and table references in section 9 are known to have some errors. John had since corrected these references and he had deleted the extra RELEASE UNIT command (the first one should be deleted). He also made a number of other editorial corrections to this section (such as changing notes containing requirements into text).

It had been pointed out that the table of contents has some errors in that page numbers don't always match the document. This was due to anomalies in the comparison program. Larry has been working with the vendor to get these anomalies fixed.

John suggested that a marked-up version of revision 7 be made during the meeting by the general editor and that it be designated revision 8. He was hopeful that the marked-up document could be forwarded to X3T9 and that a clean copy of revision 8 could be prepared for the X3T9 letter ballot.

### 9.2.1 Vendor ID Registration

John Lohmeyer stated that more than a year after X3T9.2 had requested guidance from X3T9 and X3 on vendor registration, we still did not have a satisfactory procedure for vendor ID registration. There has been a great deal of activity in the area of defining international registration authority procedures, but we still did not have a clear procedure to follow. He did not relish becoming as a test case for registration authority.

He proposed that we avoid the problem by defining the vendor ID field in the INQUIRY data as vendor specific when non-blank values are returned. An all-blank value should be defined to mean that vendor ID field is not implemented. The committee could maintain a list of vendor IDs that are known to it, but it shouldn't attempt to guarantee uniqueness.

Peter Johansson submitted proposed wording for an implementors note to describe the intention of this field.

John Morse moved and Jim McGrath seconded that the Vendor ID List be included as an appendix and Peter Johansson's wording, as modified, be included in the document.

John Lohmeyer moved and Steve Cornaby seconded that the motion be amended so that the Vendor ID List be deleted entirely from the document. The proposed amendment failed: 18 in favor, 20 opposed.

The main motion passed: 35 in favor, 3 opposed.

#### 9.2.2 Required sense data: 8 or 18 bytes?

Jim Semanak stated that with the incorporation of ASC and ASCQs in the body of the document it now seems that it should be mandatory to return those bytes in the sense data.

Bill Spence moved and Jim McGrath seconded that SCSI-2 targets be required to support the first 18 bytes of sense data. The motion passed: 25 in favor, 1 opposed.

#### 9.2.3 Combine ASC and ASCQ into single 16-bit field?

John Lohmeyer suggested that we should consider combining the ASC and ASCQ fields into one 16-bit field. The notion of these being separate fields is missing in most of the documentation. We usually say "... and set the additional sense code to XYZ", where XYZ is the name of both an ASC and an ASCQ. The whole 16-bit field should be called the additional sense code. If necessary, we could refer to the first byte as the primary ASC and the second byte as the secondary ASC.

There were several objections to this approach. In the interest of forwarding the suggestion was withdrawn.

#### 9.2.4 Should field names be first letter caps?

Many people have complained that the policy of using all lower-case for field names in the text descriptions is confusing. The descriptions often are difficult to read because the field names may be interrupted as normal English rather than a field name. John Lohmeyer spoke to the ANSI editor, Harvey Rosenfeld, the previous week about this policy. ANSI has had a change of heart and now allows initial capital letters for such purposes. They would also be willing to consider using a different font.

Mr. Rosenfeld agreed to send the current style manual and the laser printer guidelines to both John Lohmeyer and Larry Lamers. He also indicated that the ANSI style manual probably will be changed to be more compatible with the ISO style. This is not definite, yet. If we start out with the ANSI rules, he did not believe we would be required to switch to the ISO style. He unofficially advised us to use the ISO style if we plan to submit SCSI-2 to ISO.

#### 9.2.5 Should REQUEST SENSE command failure clear sense data? (89-024)

John Lohmeyer had received a call from a person who had induced parity errors while testing a vendor's product. A parity error was introduced during the DATA IN phase of a REQUEST SENSE command. The host adapter issued an INITIATOR DETECTED ERROR message which the



target responded to with MESSAGE REJECT message. After the command completed, the initiator issued a second REQUEST SENSE command. This command completed with NO SENSE sense key being returned. The target had cleared the sense data from the original error condition and gave the initiator no opportunity to get the sense data after the induced parity error.

John submitted 89-024 to revise the REQUEST SENSE wording to make it clear that the target should preserve the sense data until it is successfully transferred to the initiator.

After some discussion it was felt that the proposed change would cause some other problems (e.g., stacked sense data) and that the real problem was the target's inability to deal with initiator detected errors. Changes to the wording of the document were not made.

#### 9.2.6 SEARCH DATA command transfer length inconsistency (89-025)

John Lohmeyer stated that he had received a call from Mark Koch of Pentax Teknologies saying that the SEARCH DATA commands are ambiguous as to whether the transfer length field is the number of bytes of parameter data to be passed or the maximum number of blocks to be searched. John submitted 89-025, which would define the transfer length as the number of bytes of parameter data.

Jeff Stai saw John's proposal on the SCSI BBS and responded with the following message to John:

The transfer length is the number of blocks, not the number of bytes in the parameters list. Transfer length is defined exactly as for READ. The length of the parameter list is implicit in the command, just like READ CAPACITY and REASSIGN BLOCKS: there is a 14-byte header which includes a field defining the length of the following search argument(s). What is missing is a paragraph that says:

"The transfer length field specifies the number of contiguous logical blocks that shall be searched. A transfer length of zero indicates that no logical blocks shall be searched. This condition shall not be considered an error. Any other value indicates the number of logical blocks that shall be searched."

"Records" are sub-fields within a block (like a FAT entry) and may span multiple blocks. The "transfer length" specifies the number of blocks limit, while "number of records" specifies the number of records limit. For instance, if you had four records per block, and wanted to search 7 records, you would specify 2 blocks and the search would end after the 7 records, not the whole two blocks. The target needs both data points to understand the record structure. I think you will find that all controllers that currently do search (including ours) implement "transfer length" as a number of blocks.

John Lohmeyer said he didn't really care which definition was accepted provided that the ambiguity was removed. He had a preference for the

architectural purity of specifying the length of the parameter list in the CDB, but was willing to accept the product precedent since this command has been around for a long time.

Peter Johansson moved and Larry Lamers seconded that the Transfer Length field be changed to a Parameter List Length field and the wording from 89-25 be accepted.

Dal Allan moved and Jim McGrath seconded that the motion be amended so that bytes 7 and 8 be labeled vendor-specific.

Paul Nitza moved and Bob Snively seconded that the amendment be revised so that bytes 7 and 8 be labeled Number of Blocks to Search. The amendment passed: 11 in favor, 8 opposed.

The revised amendment stated that bytes 7 and 8 be labeled Number of Blocks to Search. The amendment passed: 18 in favor, 4 opposed.

The revised motion stated that the Transfer Length field be changed to Number of Blocks to Search and the wording from Jeff Stai's message be accepted. The motion passed: 18 in favor, 5 opposed.

Jim McGrath moved and Dal Allan seconded that the Number of Blocks to Search field be changed to vendor specific along with an implementors note stating that industry practice is to use this field as a number of blocks field. The motion failed: 7 in favor, 17 opposed.

#### 9.2.7 READ DEFECT DATA command [Gerry Houlder]

The paragraphs in the READ DEFECT DATA command describing the defect data format field are obscure because they reference the FORMAT UNIT command and then modify its meaning for this field. We should completely define the meaning of this field within the READ DEFECT DATA command description. The values for this field should be:

- |     |                        |
|-----|------------------------|
| 0   | Vendor Specific        |
| 1-3 | Reserved               |
| 4   | Bytes From Index       |
| 5   | Physical Sector Format |
| 6   | Vendor Specific        |
| 7   | Reserved               |

Plus something should be done to the paragraph following the implementors note. It is confusing and seems to imply a conflict.

Peter Johansson moved and Paul Nitza seconded that the corrections in document 89-30, page 12 be accepted to resolve this issue and that it be modified to state that when physical sector format is used that it may or may not include the complete list. The motion passed unanimously.

9.2.8 Comments on SCSI-2 (89-30, 31, 32, 33, 34, 35, 37)  
[P. Nitza, B. Pentecost, P. Bramhall, D. Appleyard, D. Davies, P. Boulay]

A poll was taken on what the correct method for handling a command received without a queue tag. The proposal is to change from handling it as an untagged queue to handling it as an ordered queue tag command. This change was accepted: 21 in favor, 12 opposed.

Peter Johansson moved and Bob Snively seconded that the logical block address returned in the sense data in REASSIGN BLOCKS be changed to the last successfully reassigned block. The motion failed: 2 in favor, 12 opposed.

Most of Paul Nitza's comments (document 89-030) were accepted. The comment on Duplicate Nexus was substantially re-written during the meeting.

Bob Pentecost's implementors note on initialization pattern (document 89-031) was accepted.

Pete Bramhall's comments (document 89-32) were accepted.

Dennis Appleyard's wording for the addition of attention condition timing delays (document 89-033) was accepted with a modification to change the length of delay to "two deskew delays" from "a deskew delay plus a cable transfer delay". His comment on the NO OPERATION message (document 89-034) was accepted for inclusion as an example.

Dan Davies revised wording for the sequential-access READ command (document 89-035) was accepted.

Paul Boulay's revised wording for Medium Element Status Descriptors (document 89-037) was accepted.

In addition several hand-written comments were received that noted misspellings and incorrect references.

The general editor has an action item to incorporate these changes in a draft for review at the next working group. Successful completion of this task may allow the document to complete the 30-day letter ballot at X3T9 prior to the next plenary meeting. Following the letter ballot the document will go into its public review period.

9.3 Cable Testing Results (X3T9.2/89-18)

John Morse presented an interim report on the testing. No particular cable/connector configuration fails absolutely. All cable/connector configurations potentially have some problems. See X3T9.2/89-40.

A complete report is slated for April.

Lowering term power (but within specification) causes failures.

Trapezoidal drivers are better with less undershoot and smaller glitches.

Alex Pappas presented his summary of testing from Sun. See 89-038 and 89-039. Maintaining terminator power is critical to safe operation. Targets should provide terminator power since there is significant drop through long cables. More detailed analysis will be available in April.

Kurt Chan presented an update on HP's testing. See 88-165 and 89-019. Spice simulations are being undertaken to correlate the bench testing and examine different terminations.

Meeting the standard does not guarantee that the implementation works.

#### 9.4 TERMINATE IMMEDIATE message re-visited (X3T9.2/88-158 Rev 1, 89-7)

The TERMINATE IMMEDIATE message was assigned to a SCSI-3 Specific-Subject Working Group (SSWG) at the last meeting by a vote of 19 to 13. Because of the close vote, the January working group reviewed this topic and concluded that a properly-edited, linguistically-correct proposal for a TERMINATE IMMEDIATE message without the actual block count message might be acceptable. The strongest objections to the proposal were on the grounds that it might delay the forwarding schedule and that the proposed mechanisms for returning the residue information were ugly.

Paul Nitza had submitted a revised proposal, which DPT has mailed to the principals, detailing the changes needed to incorporate a TERMINATE I/O PROCESS message (X3T9.2/88-158 Rev 1).

Jim McGrath moved and Peter Johansson seconded that the TERMINATE I/O PROCESS message become a SCSI-3 item. The motion failed with 13 in favor and 20 opposed.

Steve Goldman moved and Paul Nitza seconded that the TERMINATE I/O PROCESS message (88-158 R1) be incorporated into SCSI-2.

Jim McGrath moved and Bob Snively seconded that the motion be amended to make it an appendix. The amendment failed: 8 in favor, 23 opposed.

The main motion passed with 23 in favor and 10 opposed.

### 10. New Business

#### 10.1 Tape READ underlength detection (X3T9.2/89-021) [Penokie]

This proposal was withdrawn in favor of 89-35, which was accepted.

#### 10.2 SCSI-2 Forwarding motion (X3T9.2/86-109 Rev 7)

Larry Lamers moved and Bill Burr seconded that SCSI-2 (X3T9.2/86-109 Revision 8) be forwarded to X3T9 for further processing. A roll call vote was taken with the following results:

## X3T9.2 Roll Call Vote Results on Forwarding SCSI-2

Organization	Voter	Vote	Yes	No	Abstain	Absent
3M Company	Mr. Robert C. Herron	N	0	1	0	0
ACT Technology	Mr. Nathan Lee	Y	1	0	0	0
Adaptec, Inc.	Mr. Robert N. Snively	Y	1	0	0	0
Advanced Micro Devices	Mr. Scott Smyers	Y	1	0	0	0
AMP, Inc.	Mr. Charles Brill	Y	1	0	0	0
Amphenol Corp.	Mr. Michael Wingard	Y	1	0	0	0
Ancot Corp.	Mr. Jan V. Dedek	Y	1	0	0	0
Apple Computer	Mr. Harlan Andrews	Y	1	0	0	0
Archive Corp.	Mr. Sam Washburn	Y	1	0	0	0
Aspen Peripherals	(none)	A	0	0	0	1
AT&T	Mr. James J. Semenak	Y	1	0	0	0
Ballard Synergy Corp.	(none)	A	0	0	0	1
Burndy Corp.	Mr. David Barnum	N	0	1	0	0
Cinch Connector	Mr. John Guennewig	Y	1	0	0	0
Cipher Data Products, Inc.	Mr. Dan Davies	Y	1	0	0	0
Cipher/Optimem	(none)	A	0	0	0	1
Ciprico Inc.	(none)	A	0	0	0	1
Cirrus Logic Inc.	Mr. Robert Kellert	Y	1	0	0	0
Congruent Software, Inc.	Mr. Peter Johansson	N	0	1	0	0
Cygnat Systems	Mr. Bart Raudebaugh	Y	1	0	0	0
Data General Corp.	Mr. Sam Pendleton	Y	1	0	0	0
Datacopy Corp.	Mr. Mark P. Pearson	Y	1	0	0	0
DDC Pertec	Mr. Rick Ehrecke	Y	1	0	0	0
Digital Equipment Corp.	Mr. John Morse	Y	1	0	0	0
Distributed Logic Corp.	Mr. Duncan McDonald	Y	1	0	0	0
DPT	Mr. Tom Treadway	Y	1	0	0	0
Eastman Kodak Co.	Mr. Lou Edwards	Y	1	0	0	0
Emulex Corp.	Mr. Gerald Maurer	Y	1	0	0	0
ENDL	Mr. I. Dal Allan	Y	1	0	0	0
Exabyte Corp.	Mr. Bill Duran	Y	1	0	0	0
Fujitsu	Mr. Robert Liu	Y	1	0	0	0
Hewlett Packard Co.	Mr. Bob Pentecost	Y	1	0	0	0
Hirose Electric U.S.A.	Mr. Oscar Kornblum	Y	1	0	0	0
Hitachi	Mr. Fielding S. Tabb	Y	1	0	0	0
Honda Connector	Mr. David McFadden	Y	1	0	0	0
Honeywell Bull, Inc.	(none)	A	0	0	0	1
IBM Corp.	Mr. George Penokie	Y	1	0	0	0
ICL	Mr. Tony Salthouse	Y	1	0	0	0
IMPRIMIS/CDC	Mr. Gene Milligan	Y	1	0	0	0
Intergraph Corp.	(none)	A	0	0	0	1
Interphase Corp.	Mr. Craig Scott	Y	1	0	0	0
Iomega Corp.	Mr. Geoff Barton	Y	1	0	0	0
ITT Cannon	(none)	A	0	0	0	1
JAE	Mr. W. Dean Wilson	Y	1	0	0	0
Laserdrive Ltd.	(none)	A	0	0	0	1
LMS	Mr. Paul Boulay	Y	1	0	0	0
Maxtor Corp.	Mr. Lawrence J. Lamers	Y	1	0	0	0
Methode Electronics, Inc.	Mr. Bob Masterson	Y	1	0	0	0
Micropolis Corp.	Mr. Stephen Cornaby	Y	1	0	0	0
Miniscribe Corp.	(none)	A	0	0	0	1

## X3T9.2 Roll Call Vote Results on Forwarding SCSI-2

Organization	Voter	Vote	Yes	No	Abstain	Absent
Mitsubishi Electronics Amer	Mr. Daniel E. Moczarny	Y	1	0	0	0
Molex Inc.	Mr. Craig Bixler	Y	1	0	0	0
Nat. Inst. of Stnds. & Tech.	Mr. William E. Burr	Y	1	0	0	0
National Semiconductor	Mr. James Schuessler	Y	1	0	0	0
NCR Corp.	Mr. John Lohmeyer	Y	1	0	0	0
NEC	Mr. Bruce Anderson	Y	1	0	0	0
Northern Telecom, Inc.	Mr. David Filpus	Y	1	0	0	0
Olivetti	Mr. Dennis P. Trupski	Y	1	0	0	0
Optotech, Inc.	(none)	A	0	0	0	1
OTL Engineering	Mr. Paul Nitza	Y	1	0	0	0
Panasonic (Matsushita)	(none)	A	0	0	0	1
Panduit Corp.	Mr. Ed Cieniawa	Y	1	0	0	0
Peripheral Technology Inc.	(none)	A	0	0	0	1
Priam Corp.	Mr. Mike Buckert	Y	1	0	0	0
Prime Computer, Inc.	(none)	A	0	0	0	1
Quantum Corp.	Mr. James McGrath	Y	1	0	0	0
Ricoh Corporation	Mr. Toshi Iizuka	Y	1	0	0	0
Scientific Micro Systems	Mr. Bob Reid	Y	1	0	0	0
Seagate Technology	Mr. D. Michael Robinson	Y	1	0	0	0
Siemens	Mr. Dean Konell	Y	1	0	0	0
Sony Corp. of America	Ms. Rita Lin	Y	1	0	0	0
Stewart Connector Systems	Mr. David A. Hatch	N	0	1	0	0
Storage Technology Corp.	Mr. Dennis Appleyard	Y	1	0	0	0
Sun Microsystems, Inc.	Mr. Curtis A. Ridgeway	Y	1	0	0	0
Technology Forums, Ltd.	(none)	A	0	0	0	1
Texas Instruments	Mr. D. W. Spence	Y	1	0	0	0
Thomas & Betts	Mr. Harvey Waltersdorf	N	0	1	0	0
UNISYS	Mr. Peter Dougherty	Y	1	0	0	0
Viking Connectors	(none)	A	0	0	0	1
Western Digital	(none)	A	0	0	0	1
Total:			59	5	0	16

The motion carried.

Beth Stephens and Larry Lamers were appointed the Technical Editors for SCSI-2.

### 10.3 ESDI Forwarding motion (X3T9.2/87-105 Rev 3)

Dal Allan moved and Chuck Brill seconded that ESDI (X3T9.2/87-105 Revision 4) be forwarded to X3T9 for further processing. A roll call vote was taken with the following results:



## X3T9.2 Roll Call Vote Results on Forwarding ESDI

Organization	Voter	Vote	Yes	No	Abstain	Absent
3M Company	(none)	A	0	0	0	1
ACT Technology	Mr. Nathan Lee	Y	1	0	0	0
Adaptec, Inc.	Mr. Robert N. Snively	Y	1	0	0	0
Advanced Micro Devices	Mr. Scott Smyers	Y	1	0	0	0
AMP, Inc.	Mr. Charles Brill	Y	1	0	0	0
Amphenol Corp.	Mr. Michael Wingard	Y	1	0	0	0
Ancot Corp.	Mr. Jan V. Dedek	Y	1	0	0	0
Apple Computer	Mr. Harlan Andrews	Y	1	0	0	0
Archive Corp.	Mr. Sam Washburn	Y	1	0	0	0
Aspen Peripherals	Mr. John Herron	Y	1	0	0	0
AT&T	Mr. James J. Semenak	Y	1	0	0	0
Ballard Synergy Corp.	(none)	A	0	0	0	1
Burndy Corp.	Mr. David Barnum	Y	1	0	0	0
Cinch Connector	Mr. John Guennewig	Y	1	0	0	0
Cipher Data Products, Inc.	Mr. Dan Davies	Y	1	0	0	0
Cipher/Optimem	(none)	A	0	0	0	1
Ciprico Inc.	(none)	A	0	0	0	1
Cirrus Logic Inc.	Mr. Robert Kellert	Y	1	0	0	0
Congruent Software, Inc.	Mr. Peter Johansson	Y	1	0	0	0
Cygnat Systems	Mr. Bart Raudebaugh	Y	1	0	0	0
Data General Corp.	Mr. Sam Pendleton	Y	1	0	0	0
Datacopy Corp.	Mr. Mark P. Pearson	Y	1	0	0	0
DDC Pertec	(none)	A	0	0	0	1
Digital Equipment Corp.	Mr. John Morse	Y	1	0	0	0
Distributed Logic Corp.	Mr. Duncan McDonald	Y	1	0	0	0
DPT	Mr. Tom Treadway	Y	1	0	0	0
Eastman Kodak Co.	Mr. Lou Edwards	Y	1	0	0	0
Emulex Corp.	Mr. Gerald Maurer	Y	1	0	0	0
ENDL	Mr. I. Dal Allan	Y	1	0	0	0
Exabyte Corp.	Mr. Bill Duran	Y	1	0	0	0
Fujitsu	Mr. Robert Liu	Y	1	0	0	0
Hewlett Packard Co.	Mr. Bob Pentecost	Y	1	0	0	0
Hirose Electric U.S.A.	Mr. Oscar Kornblum	Y	1	0	0	0
Hitachi	Mr. Fielding S. Tabb	Y	1	0	0	0
Honda Connector	Mr. David McFadden	Y	1	0	0	0
Honeywell Bull, Inc.	(none)	A	0	0	0	1
IBM Corp.	Mr. George Penokie	Y	1	0	0	0
ICL	(none)	A	0	0	0	1
IMPRIMIS/CDC	Mr. Gene Milligan	Y	1	0	0	0
Intergraph Corp.	(none)	A	0	0	0	1
Interphase Corp.	Mr. Craig Scott	Y	1	0	0	0
Iomega Corp.	Mr. Geoff Barton	Y	1	0	0	0
ITT Cannon	(none)	A	0	0	0	1
JAE	Mr. W. Dean Wilson	Y	1	0	0	0
Laserdrive Ltd.	(none)	A	0	0	0	1
LMS	Mr. Paul Boulay	Y	1	0	0	0
Maxtor Corp.	Mr. Lawrence J. Lamers	Y	1	0	0	0
Methode Electronics, Inc.	Mr. Bob Masterson	Y	1	0	0	0
Micropolis Corp.	Mr. Stephen Cornaby	Y	1	0	0	0
Miniscribe Corp.	(none)	A	0	0	0	1

## X3T9.2 Roll Call Vote Results on Forwarding ESDI

Organization	Voter	Vote	Yes	No	Abstain	Absent
Mitsubishi Electronics Amer	Mr. Daniel E. Moczarny	Y	1	0	0	0
Molex Inc.	Mr. Craig Bixler	Y	1	0	0	0
Nat. Inst. of Stnds. & Tech.	Mr. William E. Burr	Y	1	0	0	0
National Semiconductor	Mr. James Schuessler	Y	1	0	0	0
NCR Corp.	Mr. John Lohmeyer	Y	1	0	0	0
NEC	Mr. Bruce Anderson	Y	1	0	0	0
Northern Telecom, Inc.	Mr. David Filpus	Y	1	0	0	0
Olivetti	Mr. Dennis P. Trupski	Y	1	0	0	0
Optotech, Inc.	(none)	A	0	0	0	1
OTL Engineering	Mr. Paul Nitza	Y	1	0	0	0
Panasonic (Matsushita)	(none)	A	0	0	0	1
Panduit Corp.	Mr. Ed Cieniawa	Y	1	0	0	0
Peripheral Technology Inc.	(none)	A	0	0	0	1
Priam Corp.	Mr. Mike Buckert	Y	1	0	0	0
Prime Computer, Inc.	(none)	A	0	0	0	1
Quantum Corp.	Mr. James McGrath	Y	1	0	0	0
Ricoh Corporation	Mr. Toshi Iizuka	Y	1	0	0	0
Scientific Micro Systems	Mr. Bob Reid	Y	1	0	0	0
Seagate Technology	Mr. D. Michael Robinson	Y	1	0	0	0
Siemens	Mr. Dean Konell	Y	1	0	0	0
Sony Corp. of America	Ms. Rita Lin	Y	1	0	0	0
Stewart Connector Systems	(none)	A	0	0	0	1
Storage Technology Corp.	Mr. Dennis Appleyard	Y	1	0	0	0
Sun Microsystems, Inc.	Mr. Curtis A. Ridgeway	Y	1	0	0	0
Technology Forums, Ltd.	(none)	A	0	0	0	1
Texas Instruments	Mr. D. W. Spence	Y	1	0	0	0
Thomas & Betts	Mr. Harvey Waltersdorf	Y	1	0	0	0
UNISYS	Mr. Peter Dougherty	Y	1	0	0	0
Viking Connectors	(none)	A	0	0	0	1
Western Digital	(none)	A	0	0	0	1
Total:			61	0	0	19

The motion carried.

#### 10.4 Review of new documents

See 9.2.8 above.

#### 10.5 Agenda for the Milpitas Working Group

The following draft agenda was established for the Milpitas working group meeting:

1. Review of the SCSI-2 Revision 8 changes.

## SCSI-3 Items

- 50. 87-186 SEND DIAGNOSTIC Pages [Bill Spence]
- 51. 87-203 & 87-217 LOAD SKIP MASK command proposal [Greg Floryance, Dave McIntyre]
- 52. 87-206 More than 8 devices on wide SCSI [David Harms]
- 53. 88-002 Search Command modifications [Jeff Stai]
- 54. 88-007 Expanded RelAdr Bit Definition [Paul Boulay]
- 55. 88-69R1, 88-92, & 88-100 Autoconfiguration SSWG [Jerry Marazas, Paul Nitza, Jim McGrath, Paul Boulay]
- 56. 88-127 Error Handling Action Codes [George Penokie]
- 57. 88-158 TERMINATE IMMEDIATE message [Steve Goldman]

## 11. SCSI-3 Activities

The project proposal for SCSI-3 has been approved by X3.

There were no reports from the SSWGs.

## 12. Review of Action Items

- 1. Paul Boulay will develop an appendix on single-ended terminators.
- 2. Larry Lamers will prepare revision 8 of SCSI-2.
- 3. John Lohmeyer will request X3T9 letter ballots on forwarding SCSI-2 and ESDI.

## 13. Meeting Schedule

The next meeting of X3T9.2 will be April 24-25, 1989 at the Tradewinds Hotel (813-367-6461) in St. Petersburg Beach, Florida hosted by AMP. Please mention X3T9/AMP when making reservations to receive the special room rate of \$98.00 Single or Double. The cut-off date for reservations is April 3, 1989.

The plenary meeting schedule for the remainder of 1989 is:

Date	Location	Host
June 19-20, 1989	San Jose, Ca	AMD
August 21-22, 1989	Denver	DEC
October 16-20, 1989	Research Triangle Park, NC	IBM
December 4-5, 1989	San Diego, CA	NCR

## 13.1 General Working Group Schedule for 1989

The SCSI-2/SCSI-3 Working Group meeting schedule for 1989 is:

Date	Location	Host	Note
March 6-7, 1989	Milpitas, CA	Jim McGrath	{see 89-026R0.TXT}
May 8-9, 1989	Wichita, KS	John Lohmeyer	
July 10-12, 1989	Chicago, IL	Joe Lawlor	{tentative}
September 6-8, 1989	?	?	{tentative date}
Oct 30 - Nov 1, 1989	?	?	{tentative date}

The March and May meetings have been shortened to two days.

## 13.2 Methods for Support of Future Plenary Meetings

Del Shoemaker reported that X3T9 is having some difficulty in getting hosts for meetings with sufficient lead time to insure being able to find a hotel with adequate meeting facilities. In the current environment a lead time of 18 to 24 months is needed to get adequate facilities. Most companies are not willing to undertake a commitment that far into the future.

Del presented several proposals for dealing with this: 1) establish an escrow account so that X3T9 could make the future commitments by adding a surcharge to hotel room rates; 2) charge an up-front meeting fee of \$100; or 3) reduce meeting costs by eliminating refreshments. Option 3 may not be a sufficient measure to deal with the problem.

At this point several members volunteered as hosts. At least two of these members commented that they had offered to host meetings in the past but had been rejected because their companies were not located in resort locations.

Del Shoemaker conducted several straw polls concerning these options and planned to discuss the results at the X3T9 meeting on Friday.

## 14. Adjournment

The meeting was adjourned at 2:05 p.m. on Tuesday, February 21, 1989.

## Meeting Attendees - Enclosure (1)

Name	Status	Organization
Mr. Robert C. Herron	A	3M Company
Mr. John Knudson	S	3M Company
Mr. Nathan Lee	P	ACT Technology
Mr. Robert N. Snively	P	Adaptec, Inc.
Mr. Al Wilhelm	A	Adaptec, Inc.
Mr. Scott Smyers	A	Advanced Micro Devices
Mr. Mitch Kane	A	Advanced Micro Devices
Mr. Charles Brill	P	AMP, Inc.
Mr. C. Edward Reynolds	A	AMP, Inc.
Mr. Bob Whiteman	A	AMP, Inc.
Mr. Emerson (Bud) Reynier	O	AMP, Inc.
Mr. Michael Wingard	P	Amphenol Corp.
Mr. William R. Sopchak	A	Amphenol Corp.
Mr. Jan V. Dedek	P	Ancot Corp.
Mr. Harlan Andrews	P	Apple Computer
Mr. Barton Phillips	V	Applitech
Mr. Sam Washburn	A	Archive Corp.
Mr. John Herron	P	Aspen Peripherals
Mr. James J. Semenak	A	AT&T
Mr. Cristopher J. Rhea	A	AT&T
Mr. Ronnie Geller	O	Biin
Mr. David Barnum	P	Burndy Corp.
Mr. John Guennewig	P	Cinch Connector
Mr. Dan Davies	P	Cipher Data Products, Inc.
Mr. Robert Kellert	P	Cirrus Logic Inc.
Mr. Chris Nieves	O	Computer Consoles
Mr. Peter Johansson	P	Congruent Software, Inc.
Mr. Bobby Chi	O	Convergent Technology
Mr. George Zisk	O	CW Industries
Mr. Bart Raudebaugh	P	Cygnnet Systems
Mr. Sam Pendleton	A	Data General Corp.
Mr. Mark P. Pearson	P	Datacopy Corp.
Mr. Jerry O'Keefe	A	Datacopy Corp.
Mr. Rick Ehrecke	P	DDC Pertec
Mr. John Morse	A	Digital Equipment Corp.
Mr. Del Shoemaker	L	Digital Equipment Corp.
Mr. Duncan McDonald	P	Distributed Logic Corp.
Mr. Steve Goldman	P	DPT
Mr. Tom Treadway	A	DPT
Mr. Gerald Maurer	P	Emulex Corp.
Mr. I. Dal Allan	P	ENDL
Mr. Bill Duran	A	Exabyte Corp.
Mr. Robert Liu	P	Fujitsu America, Inc.
Mr. Joel Urban	O	Fujitsu Components of America
Mr. Bob Pentecost	P	Hewlett Packard Co.
Mr. Kurt Chan	A	Hewlett Packard Co.
Mr. Pete Bramhall	O	Hewlett Packard Co.
Mr. Oscar Kornblum	A	Hirose Electric U.S.A.
Mr. Fielding S. Tabb	O	Hitachi Cable Manchester
Mr. David McFadden	P	Honda Connector
Mr. George Penokie	P	IBM Corp.
Mr. Gary R. Stephens	A	IBM Corp.

## Meeting Attendees - Enclosure (1)

Name	Status	Organization
Mr. Gerald Marazas	A	IBM Corp.
Mr. Tony Salthouse	P	ICL
Mr. Gene Milligan	P	IMPRIMIS/CDC
Mr. Craig Scott	A	Interphase Corp.
Mr. Mark Veteikis	A	Interphase Corp.
Mr. Geoff Barton	A	Iomega Corp.
Mr. W. Dean Wilson	A	JAE
Mr. Paul Boulay	A	LMS-OSD
Mr. Lawrence J. Lamers	P	Maxtor Corp.
Mr. Bob Masterson	P	Methode Electronics, Inc.
Mr. Dave Horton	O	Micron Technology
Mr. Stephen Cornaby	P	Micropolis Corp.
Mr. Daniel E. Moczarny	P	Mitsubishi Electronics Amer
Mr. James Hamada	A	Mitsubishi Electronics Amer
Mr. Craig Bixler	P	Molex Inc.
Mr. William E. Burr	P	Nat. Inst. of Stnds. & Tech.
Mr. James Schuessler	P	National Semiconductor
Mr. John Lohmeyer	P	NCR Corp.
Mr. Bruce Anderson	P	NEC I.S.
Mr. David Filpus	P	Northern Telecom, Inc.
Mr. Dennis P. Trupski	P	Olivetti
Mr. Paul Nitza	P	OTL Engineering
Mr. Ed Cieniawa	P	Panduit Corp.
Mr. Mark Koch	O	Pentax Teknologies
Mr. Mike Buckert	A	Priam Corp.
Mr. James McGrath	P	Quantum Corp.
Mr. Toshi Iizuka	A	Ricoh Corporation
Mr. Bob Reid	P	Scientific Micro Systems
Mr. D. Michael Robinson	P	Seagate Technology
Mr. Fred Burgess	V	Seagate Technology
Mr. Dean Konell	P	Siemens Info. Systems, Inc.
Ms. Rita Lin	P	Sony Corp. of America
Mr. Simon Kustedjo	P	Sony Corp. of America
Mr. David A. Hatch	P	Stewart Connector Systems
Mr. Dennis Appleyard	P	Storage Technology Corp.
Mr. Alex Pappas	V	Sun Microsystems
Mr. Curtis A. Ridgeway	P	Sun Microsystems, Inc.
Mr. Paul Rikkonen	A	Sun Microsystems, Inc.
Mr. Dexter Anderson	O	Sun Microsystems, Inc.
Mr. Tom Gardner	P	Technology Forums, Ltd.
Mr. D. W. Spence	P	Texas Instruments
Mr. Richard Dominguet	V	Texas Instruments
Mr. Harvey Waltersdorf	P	Thomas & Betts
Mr. Peter Dougherty	P	UNISYS
Mr. Ernie Derkas	O	UNISYS
Mr. Lou Edwards	O	Verbatim
Mr. Fred Stewart	V	Viking Connectors
Mr. Phil Parikh	V	Wangtek
Ms. Linda Strahle	O	Xylogics, Inc.
Mr. Saied Zangenehpour	O	Zenith Electronics

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



Feb 23, 1989 - X3T9.2 Membership Changes - Enclosure (2)

\* = P-Principal, A-Alternate, L-Liaison, O-Observer, R-Replaced, T-Terminated

FirstName LastName ----- This field contains the change reason. -----

----- Organization -----

----- Address 1 ----- \* Phone number

----- Address 2 -----

----- Address 3 -----

Mr. Nathan Lee	New Principal
ACT Technology	
p931 La Jolla	P (714) 632-9230
Anaheim, CA 92806	

Mr. Jerry L. Amstutz	New Alternate
ACT Technology	
2931 La Jolla	A (714) 632-9230
Anaheim, CA 92806	

Mr. Al Wilhelm	New Alternate
Adaptec, Inc.	
691 S. Milpitas Blvd.	A (408) 945-2525
Milpitas, CA 95035	

Mr. Harlan Andrews	Re-instated as Principal
Apple Computer	
Mail Stop 22-AA	P (408) 974-6430
20525 Mariani Ave.	
Cupertino, CA 95014	

Mr. Jerry Katzung	New Alternate was Observer
Apple Computer	
Mail Stop 27-AJ	A (408) 974-2575
20525 Mariani Ave.	
Cupertino, CA 95014	

Mr. Gus Andrade	New Observer
Apple Computer	
20525 Mariani Ave. MS 27AL	O (408) 974-6254
Cupertino, CA 95014	

Mr. Sam Washburn	New Alternate
Archive Corp.	
1650 Sunflower	A (714) 966-7378
Costa Mesa, CA 92626	

Feb 23, 1989 - X3T9.2 Membership Changes - Enclosure (2)

\* = P-Principal, A-Alternate, L-Liaison, O-Observer, R-Replaced, T-Terminated

Mr. Joe Lawlor                      was Observer, now Principal  
AT&T  
1100 E. Warrenville Rd.        P (312) 979-0133  
Rm IW 2C-435  
Naperville, IL 60566

Mr. Cristopher J. Rhea            was Observer, now Alternate  
AT&T  
1100 E. Warrenville Rd.        A (312) 979-8179  
Room 22407  
Naperville, IL 60566

Mr. Ronnie Geller                Replaces Coulson (Intel)  
Biin  
2111 N.E. 25th Ave.            O (503) 696-4686  
Hillsboro, OR 97124

Mr. Guy Prival                    Terminated -- mail returned  
Bull Peripheral Corp.  
766 San Aleso                    T (408) 745-0855  
Sunnyvale, CA 94086

Mr. Bob Pontone                  Terminated at his request  
Cinch Connector  
1501 Morse Ave.                T (312) 981-6344  
Elk Grove Village, IL 60007

Mr. Gary Fredrickson            New Observer  
Computer Consoles  
9801 Muirlands                O  
Irvine, CA 92718

Mr. Chris Nieves                New Observer  
Computer Consoles  
9801 Muirlands                O (714) 458-7282  
Irvine, CA 92718

Mr. Wayne Sanderson            Terminated at his request  
Control Data Corp.  
ARH293                        T (612) 482-2712  
4201 N. Lexington Ave.  
St Paul, MN 55126

Feb 23, 1989 - X3T9.2 Membership Changes - Enclosure (2)

\* = P-Principal, A-Alternate, L-Liaison, O-Observer, R-Replaced, T-Terminated

Mr. Bobby Chi                      New Observer  
Convergent Technology  
N. First Street M/S 9-004      O (408) 435-5247  
San Jose, CA 95150

Mr. Mark P. Pearson              Replaces Hall  
Datacopy Corp.  
1215 Terra Bella Ave.          P (415) 965-7900  
Mtn. View, CA 94587

Mr. Jerry O'Keefe                Replaces Weng  
Datacopy Corp.  
1215 Terra Bella Ave.          A (415) 965-7900  
Mtn. View, CA 94587

Mr. Sam Weng                    Terminated per Pearson  
Datacopy Corp.  
1215 Terra Bella Ave.          T (415) 965-7900  
Mtn. View, CA 94043

Mr. Ken Machado                Terminated per Pearson  
Datacopy Corp.  
1215 Terra Bella Ave.          T (415) 965-7900  
Mtn. View, CA 94043

Mr. Cliff Hall                  Replaced by Pearson - transfer mailings  
Datacopy Corp.  
1215 Terra Bella Ave.          R (415) 965-7900  
Mtn. View, CA 94043

Mr. Rick Ehrecke                New Principal  
DDC Pertec  
20400 Plummer St.              P (818) 881-0030  
P.O. Box 2198  
Chatsworth, CA 91311

Mr. Mike Racelo                New Alternate  
DDC Pertec  
20400 Plummer St.              A (818) 881-0030  
P.O. Box 2198  
Chatsworth, CA 91311

Feb 23, 1989 - X3T9.2 Membership Changes - Enclosure (2)

\* = P-Principal, A-Alternate, L-Liaison, O-Observer, R-Replaced, T-Terminated

Mr. Jeff Seideman                      Terminated -- no longer at DEST  
DEST Corp.  
1201 Cadillac Court                      T (408) 946-7100  
Milpitas, CA 95035

Mr. Jeremy Higdon                      Terminated -- no longer at DEST  
DEST Corp.  
1201 Cadillac Court                      T (408) 946-7100  
Milpitas, CA 95035

Mr. Stephen Fitzgerald                      Zip Code changed  
Eastman Kodak Co.  
DTGRL                                      A (716) 588-0219  
460 Buffalo Rd.  
Rochester, NY 14652-3801

Mr. Bob Strich                              Terminated for non-attendance  
ELCO Corp.  
1500 Quail St., Ste 220                      O (714) 476-8462  
Newport Beach, CA 92660

Mr. Tom Anderson                              Terminated for non-attendance  
ELCO Corp.  
Huntingdon Industrial Park                      O (814) 643-0700  
Huntingdon, PA 16652-3117

Mr. Michael Braitberg                              New Principal  
Exabyte Corp.  
1745 38th St.                              P (303) 442-4333  
Boulder, CO 80301

Mr. Bill Duran                              New Alternate  
Exabyte Corp.  
1745 38th St.                              A (303) 442-4333  
Boulder, CO 80301

Mr. Ed Bleichner                              Terminated -- no such street  
Fujitsu Microelectronics  
3500 Parkway Lane, Suite 210                      T (404) 449-8539  
Atlanta, GA

Feb 23, 1989 - X3T9.2 Membership Changes - Enclosure (2)

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Mr. Kurt Chan                      Added Mail Stop  
Hewlett Packard Co.  
8000 Foothills Blvd. MS R3NF A (916) 785-5621  
Roseville, CA 95678

Mr. Jim Erickson                  Replaces Calvin  
Hirose Electric U.S.A.  
2685 Park Center Drive          P (805) 522-7958  
Simi Valley, CA 93065

Mr. Oscar Kornblum               Replaces Kosmala  
Hirose Electric U.S.A.  
2685 Park Center Drive          A (805) 522-7958  
Simi Valley, CA 93065

Mr. Ray Calvin                   Replaced by Erickson  
Hirose Electric U.S.A.  
9254 Deering Av.                R (818) 709-1247  
Chatsworth, CA 91311

Mr. Michael Kosmala              Replaced by Kornblum  
Hirose Electric U.S.A.  
9254 Deering Ave.               R (818) 709-1247  
Chatsworth, CA 91311

Mr. Kiyotake Kumazawa           New Observer  
Hitachi America, Ltd.  
950 Elm Ave. Suite 100  
San Bruno, CA 94066            O (415) 872-1902

Mr. Sherman Black               Terminated per Kumazawa - transfer mailings to Jones  
Hitachi Computer Products  
P.O. Box 1203                    T (405) 360-5500  
Norman, OK 73070-1203

Mr. Greg Floryance               Terminated at his request  
IBM Corp.  
Dpt. 3E2, Bldg. 114-2          T (507) 253-1869  
37 St., Highway 52  
Rochester, MN 55901

Feb 23, 1989 - X3T9.2 Membership Changes - Enclosure (2)

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Mr. Richard Coulson                      Replaced by Geller (Biin) - transfer mailings  
Intel Corp.  
HF2-1-108                                  R (503) 681-5287  
5200 Elam Young Pkwy.  
Hillsboro, OR 97123

Mr. Mark Veteikis                      New Alternate  
Interphase Corp.  
2925 Merrell Rd.                          A (214) 350-9000  
Dallas, TX 75229

Mr. Bruce Brunette                      Terminated at his request.  
Introl Corp.  
P.O. Box 64750                            T (612) 789-2421 x46  
St. Paul, MN 55164-0750

Mr. D. Shaff                              New Principal - was Observer  
JAE  
1901 E. Carnegie Av., Suite A          P (714) 250-8770  
Santa Ana, CA 92705-5504

Mr. W. Dean Wilson                      New Alternate  
JAE  
1901 E. Carnegie                          A (714) 250-8770  
Santa Ana, CA 92705-5504

Mr. David Scheffey                      Changed to Observer -- non-attendance  
Maxon Systems, Inc.  
353 Vintage Park Dr., Suite B          O (415) 377-0202  
Foster City, CA 94404

Mr. Lawrence J. Lamers                   Replaces Mortensen as Principal (was at Sony)  
Maxtor Corp.  
211 River Oaks Pkwy                      P (408) 432-4341  
San Jose, CA 95134

Mr. Bob Mortensen                      Was Principal  
Maxtor Corp.  
211 River Oaks Pkwy                      A (408) 432-4447  
San Jose, CA 95134



Feb 23, 1989 - X3T9.2 Membership Changes - Enclosure (2)

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Mr. Dan Paplowski                      Replaces Weaver as Alternate (was Observer)  
Methode Electronics, Inc.  
7444 West Wilson Av.                  A (312) 867-9600  
Chicago, IL 60656

Mr. Hobie Weaver                      Terminated per Masterson  
Methode Electronics, Inc.  
3125 Poplarwood Ct.                  T (919) 878-0988  
PO Box 95073  
Raleigh, NC 27625

Mr. Craig Bixler                      Replaces Lovelady  
Molex Inc.  
2222 Wellington Court                P (312) 969-4550  
Lisle, IL 60532

Mr. Randy Lovelady                    Replaced by Bixler -- transfer mailings  
Molex Inc.  
2222 Wellington Ct.                  R (312) 969-4550  
Lisle, IL 60532

Mr. William E. Burr                   Address Change  
Nat. Inst. of Stnds. & Tech.  
Bldg. 233, Rm B364                   P (301) 975-2914  
Gaithersburg, MD 20899

Mr. Bruce Anderson                   Address and phone change  
NEC I.S.  
1414 Massachusetts Ave.              P (508) 264-8064  
Boxborough, MA 01719

Mr. Dennis R. Powell                   Address and phone change  
NEC I.S.  
1414 Massachusetts Ave.              A (508) 264-8065  
Boxborough, MA 01719

Mr. Jeffry G. Shaw                   Terminated at his request  
Oaktree Systems  
P.O. Box 32250                        T (408) 258-4059  
San Jose, CA 95152

Feb 23, 1989 - X3T9.2 Membership Changes - Enclosure (2)

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Mr. Glen Nance Quantum Corp. 1804 McCarthy Blvd. Milpitas, CA 95035	Replaces Lo as Alternate (was Observer)  A
Mr. Tony Lo Quantum Corp. 1804 McCarthy Blvd. Milpitas, CA 95035	Terminated - left Quantum (was Alternate)  T (408) 432-1100
Mr. Tom Mager Quantum Corp. 1804 McCarthy Blvd. Milpitas, CA 95035	Terminated - left Quantum (was Observer)  T (408) 432-1100
Mr. Toshi Iizuka Ricoli Corporation 5150 El Camino Real, D-20 Los Altos, CA 94022	New Alternate  A (415) 962-0443
Mr. Bob Reid Scientific Micro Systems 339 N. Bernardo Ave. P. O. Box 7777 Mtn View, CA 94039	Replaces by Anderson -- transfer mailings  P (415) 962-5457
Mr. Dexter Anderson Scientific Micro Systems 339 N. Bernardo Ave. P. O. Box 7777 Mtn View, CA 94039	Replaced by Reid  R (415) 962-5457
Ms. Rita Lin Sony Corp. of America 15 Essex Rd. 4th Fl Paramus, NJ 07652	Replaces Lamers  P (201) 368-5190
Mr. Simon Kustedjo Sony Corp. of America 15 Essex Rd. 4th Fl Paramus, NJ 07652	Replaces Yokoyama  P (201) 368-5167

Feb 23, 1989 - X3T9.2 Membership Changes - Enclosure (2)

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Mr. Masayuki Yokoyama Sony Corp. of America 655 River Oaks Parkway San Jose, CA 95134	Replaced by Kustedjo  R (408) 432-0190
Mr. Lawrence J. Lamers Sony Corp. of America 655 River Oaks Parkway San Jose, CA 95134	Replaced by Lin -- transfer mailings  R (408) 432-0190
Mr. Dexter Anderson Sun Microsystems, Inc. 2550 Garcia Ave. Mountain View, CA 94043	New Observer  O
Mr. Paul Phillips Thomas & Betts 1001 Frontier Road Bridgewater, NJ 08807	Terminated per Waltersdorf  T (201) 685-1600
Mr. Allan Bradley Tolerant Systems 81 East Daggett Drive San Jose, CA 95134	Terminated at his request  T
Mr. M. Perugini Winchester Electronics 400 Park Road Watertown, CT 06795	Terminated at his request  T (203) 274-8891
Mr. Martin Pullam Winchester Electronics 400 Park Road Watertown, CT 06795	Terminated at his request  T (203) 274-8891 x366
Mr. Peter Wexler Xylogics, Inc. 144 Middlesex Tpk. Burlington, MA 01803	Added from CBEMA list  O

Feb 23, 1989 - X3T9.2 Membership Changes - Enclosure (2)

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Mr. George W. Zeissner	Terminated at his request
Zeissner Engineering	
8728 Frazer River Circle	T
Fountain Valley, CA 92708	

Mr. Saied Zangenehpour	New Observer
Zenith Electronics	
Hilltop Road	O (616) 982-3509
St. Joseph, MI 49085	

Feb 23, 1989 - X3T9.2 Active Membership sorted by Organization - Enclosure (3)

Name	S	Organization	Address1	Address2	Address3	Phone	FAX
Mr. Wayne E. Roen	P	3M Company	3M Center	Bldg. 236-GN-06	St. Paul, MN 55144	(612) 736-3149	(612) 733-4707
Mr. Robert C. Herron	A	3M Company	Bldg. 141-3S-03	P.O. Box 2963	Austin, TX 78769-2963	(512) 984-6807	(512) 984-2184
Mr. Chuck Kummeth	A	3M Company	3M Center	Bldg. 236-GN-06	St. Paul, MN 55144	(612) 733-0613	(612) 733-4707
Mr. Nathan Lee	P	ACT Technology	p931 La Jolla	Anaheim, CA 92806		(714) 632-9230	
Mr. Jerry L. Amstutz	A	ACT Technology	2931 La Jolla	Anaheim, CA 92806		(714) 632-9230	
Mr. Robert N. Snively	P	Adaptec, Inc.	691 S. Milpitas Blvd.	Milpitas, CA 95035		(408) 945-6789	(408) 262-2533
Mr. Al Wilhelm	A	Adaptec, Inc.	691 S. Milpitas Blvd.	Milpitas, CA 95035		(408) 945-2525	(408) 262-2533
Mr. Robert R. Williamsen	A	Adaptec, Inc.	691 S. Milpitas Blvd.	Milpitas, CA 95035		(408) 945-8600	
Mr. Nicos Syrimis	P	Advanced Micro Devices	901 Thompson Place, MS 70	Sunnyvale, CA 94088		(408) 749-2513	
Mr. Mitch Kane	A	Advanced Micro Devices	901 Thompson Place, MS 70	Sunnyvale, CA 94088		(408) 749-4828	(408) 749-2825
Mr. Scott Smyers	A	Advanced Micro Devices	901 Thompson Place, MS 70	Sunnyvale, CA 94088		(408) 749-4248	(408) 749-2825
Mr. William J. Casey	O	Advanced Storage Concepts	10855 Rockley Road	Houston, TX 77099		(713) 879-4090	
Mr. Steve Caldara	O	Alliant Computer Systems	One Monarch Drive	Littleton, MA 01460			
Mr. H. Dorris	O	American Bell	Headquarters Plaza - W	1 Speedwell Av Rm 0966W	Morristown, NJ 07960	(201) 898-2234	
Mr. Charles Brill	P	AMP, Inc.	Mail Stop 210-20	P. O. Box 3608	Harrisburg, PA 17105	(717) 561-6198	
Mr. C. Edward Reynolds	A	AMP, Inc.	P.O. Box 3608 M/S 26-17	Harrisburg, PA 17105		(717) 780-6558	
Mr. Bob Whiteman	A	AMP, Inc.	P.O. Box 3608 M/S 26-17	Harrisburg, PA 17105		(717) 780-7481	
Mr. John H. Endsley	O	AMP, Inc.	Mail Stop 210-20	P.O. Box 3608	Harrisburg, PA 17105	(717) 561-6199	
Mr. Edward Marsh	O	AMP, Inc.	3800 Reidsville Rd., MS 79-27	Winston-Salem, NC 27102		(919) 996-6049	
Mr. Emerson (Bud) Reyner	O	AMP, Inc.	P.O. Box 3608	Harrisburg, PA 17105		(717) 986-7946	
Mr. Michael Wingard	P	Amphenol Corp.	Endicott Operations	20 Valley St.	Endicott, NY 13760	(607) 786-4241	
Mr. William R. Sopchak	A	Amphenol Corp.	Endicott Operations	20 Valley St.	Endicott, NY 13760	(607) 786-4370	
Mr. Robert Wiggin	O	Amphenol Corp.	720 Sherman Ave.	Hamden, CT 06514			
Mr. Rick Lehrbaum	O	AMPRO Computers, Inc.	67 E. Evelyn Ave.	Mtn. View, CA 94041		(415) 962-0230	
Mr. Nick Terry	O	Anamartic Ltd.	Milton Hall	Milton, Cambridge	CB4 4AE England	0223 862 833	
Mr. Jan V. Dedek	P	Ancot Corp.	1755 E. Bayshore Rd.	Suite 18A	Redwood City, CA 94063	(415) 363-0667	(415) 363-0735
Mr. Charles Jarboe	O	Apollo Computer	300 Apollo Drive	Chelmsford, MA 01824		(508) 256-6600	
Mr. Alan Andrews	P	Apple Computer	Mail Stop 22-AA	20525 Mariani Ave.	Cupertino, CA	(408) 974-6430	

Feb 23, 1989 - X3T9.2 Active Membership sorted by Organization - Enclosure (3)

Name	S	Organization	Address1	Address2	Address3	Phone	FAX
Mr. Jerry Katzung	A	Apple Computer	Mail Stop 27-AJ	20525 Mariani Ave.	95014 Cupertino, CA (408) 974-2575		
Mr. Gus Andrade	O	Apple Computer	20525 Mariani Ave. MS 27AL	Cupertino, CA 95014		(408) 974-6254	
Mr. Jeff Chen	O	Apple Computer	Mail Stop 22-AA	20525 Mariana Ave.	95014 Cupertino, CA (408) 974-2815		
Mr. Matt Gulick	O	Apple Computer	Mail Stop 27-AL	10500 DeAnza Blvd.	95014 Cupertino, CA (408) 974-5382		
Mr. Ali Khosrowpour	O	Applied Data Communications	14272 Chambers Rd.	Tustin, CA 92680		(714) 731-9000	
Mr. Randy Sprague	O	Applied Microsystems Corp.	5020 148th Ave. N. E.	P. O. Box C-1002	98073-1002 Redmond, WA	(202) 882-2000	
Mr. Ken Post	P	Archive Corp.	1650 Sunflower Ave.	Costa Mesa, CA 92626		(714) 966-7360	
Mr. Chuck Fannin	A	Archive Corp.	1650 Sunflower Ave.	Costa Mesa, CA 92626		(714) 966-2274	
Mr. Sam Washburn	A	Archive Corp.	1650 Sunflower	Costa Mesa, CA 92626		(714) 966-7378	
Mr. John Herron	P	Aspen Peripherals	1351 S. Sunset St.	Longmont, CO 80501		(303) 678-0808	
Mr. George Reichenberg	A	Aspen Peripherals	1351 S. Sunset St.	Longmont, CO 80501		(303) 678-0808	
Mr. Joe Lawlor	P	AT&T	1100 E. Warrenville Rd.	Rm IW 2C-435	60566 Naperville, IL	(312) 979-0133	
Mr. David Harms	A	AT&T	1100 E. Warrenville Rd.	Rm IW 2C-427	60566 Naperville, IL	(312) 979-0159	
Mr. Cristopher J. Rhea	A	AT&T	1100 E. Warrenville Rd.	Room 2Z407	60566 Naperville, IL	(312) 979-8179	
Mr. James J. Semenak	A	AT&T	1100 E. Warrenville Rd.	Room 2A-138	60566 Naperville, IL	(312) 979-7981	
Ms. Ellen Haney	O	AT&T	1100 E. Warrenville Rd.	Room 2F-232	60566 Naperville, IL	(312) 979-8135	
Mr. Larry Marak	O	AT&T	Dept 700420	777 North Blue Parkway	64063 Lee's Summit, MO	(816) 251-4538	
Mr. Philip J. Puglisi	O	AT&T	Dept. 240570	777 N. Blue Pkwy.	64063 Lee's Summit, MO	(816) 251-5189	
Mr. Don Stephenson	O	Aura Systems	3548 Starboard Circle	Oceanside, CA 92054		(619) 722-5146	
Mr. Clinton Ballard	P	Ballard Synergy Corp.	10601 S. DeAnza, #212	Cupertino, CA 95014		(408) 257-8844 (408) 257-8913	
Mr. Gregory Fry	A	Ballard Synergy Corp.	10601 S. DeAnza Blvd. #212	Cupertino, CA 95014		(408) 257-8844 (408) 257-8913	
Ms. Diane T. Ballard	O	Ballard Synergy Corp.	10601 S. DeAnza, #212	Cupertino, CA 95014		(408) 257-8844 (408) 257-8913	
Mr. James Keene	O	Belden Wire & Cable	P.O. Box 1980	Richmond, IN 47777		(317) 983-5200	
Mr. Ronnie Geller	O	Biin	2111 N.E. 25th Ave.	Hillsboro, OR 97124		(503) 696-4686 (503) 696-4210	
Mr. Michael C. Muma	O	Boeing Computer Services	P.O. Box 24346 6R-24	M/S Seattle, WA 98124-0346			
Mr. Christian Mollard	O	BULL Systems	Rue Jean Jaures	Les Clayes Sous Bois	FRANCE 78340	134627128	
Mr. David Barnum	P	Burndy Corp.	311 Greenhill Road	Madison, CT 06443		(203) 852-6062 (203) 852-6227	
Mr. Heinz Piorunneck	A	Burndy Corp.	Richards Ave.	Norwalk, CT 06856		(203) 852-8480 (203) 852-6227	
Mr. Kirk Hollinsworth	O	Cable and Computer Technology	1560 S. Sinclair St.	Anaheim, CA 92806			

Feb 23, 1989 - X3T9.2 Active Membership sorted by Organization - Enclosure (3)

Name	S	Organization	Address1	Address2	Address3	Phone	FAX
Mr. John Contreras	O	Caliper	19701 S. Vermont Ave.	Torrance, CA 90502		(213) 538-1030	
Ms. Kathleen McMillan	L	CBEMA (X3 Secretariat)	311 First St., N. W.	Suite 500	Washington, DC 20001	(202) 737-8888	
Mr. Vince Zappia	O	Century Data Systems	1270 N. Kraemer Blvd.	Anaheim, CA 92806		(714) 99-2623	
Mr. John J. Hanley	O	Chantal Industries	6786 Fisk Ave.	San Diego, CA 92122		(619) 452-0975	
Mr. Ron Sutton	O	Cherokee Data Systems, Inc.	1880 S. Flatiron Court	Suite H	Boulder, CO 80301		
Mr. Edgar Macachor	O	Chips and Technologies	3050 Zanker Rd.	San Jose, CA 95134		(408) 434-0600	
Mr. John Guennewig	P	Cinch Connector	1501 Morse Avenue	Elk Grove Village, IL 60007		(312) 981-6070	(312) 981-6132
Mr. Al Consiglio	A	Cinch Connector	1501 Morse Ave.	Elk Grove Village, IL 60007		(312) 981-4298	(312) 981-6132
Mr. Dan Davies	P	Cipher Data Products, Inc.	10101 Old Grove Rd.	Mail Stop D12	San Diego, CA 92138	(619) 578-9100	(619) 549-8037
Mr. David Thomas	A	Cipher Data Products, Inc.	10101 Old Grove Rd.	Mail Stop D9	San Diego, CA 92138	(619) 578-9100	
Mr. Ishtiyag Syed	P	Cipher/Optimem	297 N. Bernardo Ave.	Mountain View, CA 94043		(415) 961-1800	
Ms. Beth Stephens	A	Cipher/Optimem	297 N. Bernardo Ave.	Mountain View, CA 92138		(415) 961-1800	(415) 961-8913
Mr. Bill Winterstein	P	Ciprico Inc.	2955 Xenium Ln.	Plymouth, MN 55441		(612) 559-2034	
Mr. Tom Wicklund	A	Ciprico Inc.	2955 Xenium Ln.	Plymouth, MN 55441		(612) 559-2034	
Mr. Robert Kellert	P	Cirrus Logic Inc.	1463 Centre Pointe Drive	Milpitas, CA 95035		(408) 945-8305	
Mr. Chen	A	Cirrus Logic Inc.	1463 Centre Pointe Drive	Milpitas, CA 95035		(408) 945-8300	
Mr. Lam Dang	A	Cirrus Logic Inc.	1463 Centre Pointe Drive	Milpitas, CA 95035		(408) 945-8300	
Mr. Bill Clark	O	Clark Assoc., Inc.	100 Arapahoe Ave.	Suite 10	Boulder, CO 80302		
Mr. Ken Bush	O	Compaq Computer Corp.	20555 FM 149	Houston, TX 77070		(612) 789-1694	
Mr. R. A. Stokken	O	Compugraphic Corp.	200 Ballardvale St.	Wilmington, MA 01877		(617) 658-5600	
Mr. Gary Fredrickson	O	Computer Consoles	9801 Muirlands	Irvine, CA 92718			
Mr. Chris Nieves	O	Computer Consoles	9801 Muirlands	Irvine, CA 92718		(714) 458-7282	
Mr. Peter Johansson	P	Congruent Software, Inc.	3998 Whittle Ave.	Oakland, CA 94602		(415) 531-5472	
Mr. Thomas A. Fiers	O	Connor Peripherals, Inc.	P. O. Box 479	Longmont, CO 80501		(303) 651-2881	
Mr. Roger Cummings	O	Control Data Canada Ltd.	1855 Minnesota Court	Mississauga Ontario L5N 1K7		(416) 826-8640	
Mr. Douglas C. Johnson	O	Control Data Corp.	Data Sys. Roseville Div.	2401 North Fairview Ave.	St. Paul, MN 55113		
Mr. Michael E. Galyon	O	Control Technology, Inc.	P.O. Box 59003	5734 Middlebrook Pike	Knoxville, TN 37950-9003		
Mr. Bobby Chi	O	Convergent Technology	N. First Street M/S 9-004	San Jose, CA 95150		(408) 435-5247	
Mr. George Battrick	O	Crosfield Electronics Ltd.	Three Cherry Trees Lane	Hemel Hempstead HP2 7RH	England	(0442) 230000	(0442) 232301



Feb 23, 1989 - X3T9.2 Active Membership sorted by Organization - Enclosure (3)

Name	S	Organization	Address1	Address2	Address3	Phone	FAX
Ms. Kathy Lifson	O	CH Industries	130 James Way	Southampton, PA 18966		(215) 355-7080	
Mr. George Zisk	O	CH Industries	130 James Way	Southampton, PA 18966		(215) 355-7080	
Mr. Bart Raudebaugh	P	Cygnnet Systems	601 West California Ave.	Sunnyvale, CA 94086-4831		(408) 773-0770	(408) 733-3358
Mr. Steve Brooks	A	Cygnnet Systems	601 West California Ave.	Sunnyvale, CA 94086-4831		(408) 773-0770	(408) 733-3358
Mr. Greg Green	P	Data General Corp.	Technology Dr.	Durham, NH 03824		(603) 862-6250	
Mr. Mark Lippitt	A	Data General Corp.	Technology Dr.	Durham, NH 03824		(603) 862-6243	
Mr. Sam Pendleton	A	Data General Corp.	Technology Dr.	Durham, NH 03824		(603) 862-6243	
Mr. Scott Solomon	O	Data General Corp.	4400 Computer Dr. F213	MS Westboro, MA 01581		(617) 870-9785	
Mr. Mark P. Pearson	P	Datacopy Corp.	1215 Terra Bella Ave.	Mtn. View, CA 94587		(415) 965-7900	(415) 965-3474
Mr. Mel Herman	A	Datacopy Corp.	1215 Terra Bella Ave.	Mtn. View, CA 94043		(415) 965-7900	
Mr. Jerry O'Keefe	A	Datacopy Corp.	1215 Terra Bella Ave.	Mtn. View, CA 94587		(415) 965-7900	
Mr. John Farnsworth	O	Datapoint Corp.	MS S33	9725 Datapoint Dr.	San Antonio, TX 78284	(512) 699-5443	
Mr. Phil Devin	L	Dataquest	1290 Ridder Park Dr.	San Jose, CA 95131		(408) 971-9000	
Mr. Rick Ehrecke	P	DDC Pertec	20400 Plummer St.	P.O. Box 2198	Chatsworth, CA 91311	(818) 881-0030	
Mr. Mike Racelo	A	DDC Pertec	20400 Plummer St.	P.O. Box 2198	Chatsworth, CA 91311	(818) 881-0030	
Mr. James T. Benfer	O	Digi-Data	8580 Dorsey Run Road	Jessup, MD 20794		(301) 498-0200	
Mr. Gary S. Robinson	P	Digital Equipment Corp.	Mail stop ML 12-3/E51	146 Main Street	Maynard, MA 01754	(508) 493-4094	
Mr. John Morse	A	Digital Equipment Corp.	Mail Stop ML05-2/G1	146 Main Street	Maynard, MA 01754	(508) 493-5801	
Mr. Del Shoemaker	L	Digital Equipment Corp.	1331 Pennsylvania Ave NW	Suite 600, MS: WNP	Washington, DC 20004	(202) 383-5622	(202) 383-5024 or 5608
Mr. Alan Arnaud	O	Digital Equipment Corp.	333 South Street	SHR1-4/D10	Shrewsbury, MA 01545	(508) 841-2301	
Mr. Edward A. Gardner	O	Digital Equipment Corp.	301 Rockrimmon Blvd. S.	CXO 1-2/N26	Col. Springs, CO 80919	(719) 548-2247	
Mr. Richard Lewis	O	Digital Equipment Corp.	P.O. Box 80	ABO/A1	Albuquerque, NM 87103		
Mr. Charles Monia	O	Digital Equipment Corp.	100 Nickseson Rd.	Marlboro, MA 01777			
Mr. Duncan McDonald	P	Distributed Logic Corp.	1555 S. Sinclair	Anaheim, CA 92806		(714) 937-5700	(714) 978-2420
Mr. Ed Carmona	A	Distributed Logic Corp.	1555 S. Sinclair St.	Anaheim, CA 92806		(714) 937-5700	
Mr. Bill Grace	O	Distributed Logic Corp.	1555 S. Sinclair St.	Anaheim, CA 92806		(714) 937-5700	
Mr. Steve Goldman	P	DPT	132 Candace Dr.	Maitland, FL 32751		(407) 830-5522	(407) 260-5366
Mr. Tom Treadway	A	DPT	132 Candace Dr.	Maitland, FL 32751		(407) 830-5522	
Mr. Jim Mulligan	O	Dupont Connector Systems	515 Fishing Creek Rd.	New Cumberland, PA 17070		(717) 938-7671	
Mr. Michael Kaplit	O	DuPont Electronics	P.O. Box 13999	Research Triangle Park, NC	27709		
Mr. Roger Derr	P	Eastman Kodak Co.	Mass Memory Division	460 Buffalo Rd.	Rochester, NY 14611	(716) 588-0596	

Feb 23, 1989 - X3T9.2 Active Membership sorted by Organization - Enclosure (3)

Name	S	Organization	Address1	Address2	Address3	Phone	FAX
Mr. Stephen Fitzgerald	A	Eastman Kodak Co.	DTGRL	460 Buffalo Rd.	Rochester, NY 14652-3801	(716) 588-0219	
Mr. D. Hekimi	L	ECMA	Rue du Rhone 114	CH-1204 Geneva	Switzerland		
Mr. Robert B. Anthony	O	EG&G WASC, Inc	P. O. Box 552	Dahlgren, VA 22448		(703) 663-2161	
Mr. Arnold J. Roccati	O	EG&G WASC, Inc	1396 Piccard Dr.	Rockville, MD 20850		(301) 840-3277	
Mr. Tom Anderson	O	ELCO Corp.	Huntingdon Industrial Park	Huntingdon, PA 16652-3117		(814) 643-0700	(814) 643-0426
Mr. Bob Strich	O	ELCO Corp.	1500 Quail St., Ste 220	Newport Beach, CA 92660		(714) 476-8462	
Mr. Tom Fitzgerald	O	Electronic Processors, Inc.	P.O. Box 569	Englewood, CO 80151		(303) 761-8540	
Mr. Gerald Maurer	P	Emulex Corp.	3545 Harbor Blvd.	P.O. Box 6725	Costa Mesa, CA 92626	(714) 662-5600	(714) 241-0792
Mr. Paul Hanmann	A	Emulex Corp.	3545 Harbor Blvd.	P.O. Box 6725	Costa Mesa, CA 92626	(714) 662-5600	(714) 241-0792
Ms. Kim V. Le	A	Emulex Corp.	3545 Harbor Blvd.	P.O. Box 6725	Costa Mesa, CA 92626	(714) 662-5600	
Mr. I. Dal Allan	P	ENDL	Vice Chair, X3T9.2	14426 Black Walnut Ct.	Saratoga, CA 95070	(408) 867-6630	(408) 867-2115
Mr. Ken Hallam	A	ENDL	29112 Country Hills Rd.	San Juan Capistrano, CA 92675		(714) 364-9626	
Mr. David Therrien	O	Epoch Systems	313 West Boston Post Rd.	Marlboro, MA 01752			
Mr. Ng	O	Everex Systems, Inc.	9440 Telstar Ave.	El Monte, CA 91731-2906			
Mr. Michael Braitberg	P	Exabyte Corp.	1745 38th St.	Boulder, CO 80301		(303) 442-4333	(303) 442-4269
Mr. Bill Duran	A	Exabyte Corp.	1745 38th St.	Boulder, CO 80301		(303) 442-4333	
Mr. Michael Rudy	O	FileNet Corp.	3530 Hyland Ave.	Costa Mesa, CA 92626		(714) 966-2344	
Mr. Robert B. Mason	O	Flexstar, Inc.	606 Valley Way	Milpitas, CA 95035-4138		(408) 946-1445	
Mr. Paul Kuphal	O	Formation, Inc.	823 East Gate Drive	Mt. Laurel, NJ 08054			
Mr. Robert Liu	P	Fujitsu America, Inc.	3055 Orchard Dr.	San Jose, CA 95134		(408) 432-1300	(408) 432-1318
Mr. David Snook	A	Fujitsu America, Inc.	3055 Orchard Dr.	San Jose, CA 95134		(408) 432-1300	
Mr. Bob Thornton	O	Fujitsu Components of America	3330 Scott Blvd	Santa Clara, CA 95054		(408) 562-1735	(408) 727-0355
Mr. Joel Urban	O	Fujitsu Components of America	3330 Scott Blvd.	Santa Clara, CA 95054		(408) 562-1722	(408) 727-0355
Mr. Michael Rydquist	O	Fujitsu Limited	Fujitsu America, Inc.	7300 NE Evergreen Pkwy.	Hillsboro, OR 97124	(503) 681-7300	
Mr. Dan Landeck	O	Fujitsu Microelectronics	3545 N. First St.	San Jose, CA 95134		(408) 562-1391	
Ms. Nusra Lodhi	O	Fujitsu Microelectronics	3320 Scott Blvd.	Santa Clara, CA 95054		(408) 562-1463	
Mr. John Reimer	O	Fujitsu Microelectronics	3545 N 1st St.	San Jose, CA 95134-1804		(408) 922-9390	

Feb 23, 1989 - X3T9.2 Active Membership sorted by Organization - Enclosure (3)

Name	S	Organization	Address1	Address2	Address3	Phone	FAX
Mr. Bob Pentecost	P	Hewlett Packard Co.	Disc Memory Div.	11413 Chinden Blvd, MS 216	Boise, ID 83707	(208) 323-3312	
Mr. Kurt Chan	A	Hewlett Packard Co.	8000 Foothills Blvd. MS R3NF	Roseville, CA 95678		(916) 785-5621	
Mr. Dave McIntyre	A	Hewlett Packard Co.	Disk Memory Div.	11413 Chinden, MS-221	Boise, ID 83707	(208) 323-3003	(208) 323-2896
Mr. Pete Bramhall	O	Hewlett Packard Co.	Filton Road Stoke Gifford	Bristol BS12 6QZ	England	(0272) 799910	0272 236091
Mr. Joel Dunning	O	Hewlett Packard Co.	8000 Foothills Blvd.	Roseville, CA 95678		(916) 786-8000	
Mr. Greg Hite	O	Hewlett Packard Co.	Disk Memory Div.	POB 39, MS-213	Boise, ID 83707	(208) 323-3208	
Ms. Elen Hunt	O	Hewlett Packard Co.	700 71st Ave.	Greeley, CO 80634		(303) 350-4551	
Mr. Don Loughry	O	Hewlett Packard Co.	11000 Wolf Rd.	Cupertino, CA 95014		(408) 257-7000 x2454	
Mr. Fred Pramann	O	Hewlett Packard Co.	3000 Hanover St.	P.O. Box 10301	Palo Alto, CA 94303-0890	(415) 857-2048	
Mr. Pat Walker	O	Hewlett Packard Co.	Disc Memory Div.	11413 Chinden Blvd, MS 219	Boise, ID 83707	(208) 323-2418	
Mr. Jim Erickson	P	Hirose Electric U.S.A.	2685 Park Center Drive	Simi Valley, CA 93065		(805) 522-7958	(805) 522-3217
Mr. Oscar Kornblum	A	Hirose Electric U.S.A.	2685 Park Center Drive	Simi Valley, CA 93065		(805) 522-7958	(805) 522-3217
Mr. Toshiaki Kojima	O	Hitachi America, Ltd.	950 Elm Ave. Suite 300	San Bruno, CA 94066		(415) 872-1902	
Mr. Kiyotake Kumazawa	O	Hitachi America, Ltd.	950 Elm Ave. Suite 100	San Bruno, CA 94066		(415) 872-1902	(415) 872-1902
Mr. Kenji Nishimura	O	Hitachi America, Ltd.	950 Elm Ave	San Bruno, CA 94066		(415) 872-1902	
Mr. Fielding S. Tabb	O	Hitachi Cable Manchester	900 Holt Ave.	Manchester, NH 03103		(603) 669-4347	(603) 669-6629
Mr. Timothy D. Jones	O	Hitachi Computer Products	1800 E. Imhoff Rd.	Norman, OK 73071		(405) 360-5500	
Dr. Sam Karunanithi	P	Hitachi Micro Systems, Inc.	180 Rose Orchard Way	San Jose, CA 95134		(408) 433-1990	
Mr. David McFadden	P	Honda Connector	% Mhotronics	444 Lake Cook Rd., Suite 8	Deerfield, IL 60015	(312) 945-5600	(312) 948-5604
Mr. Hiroshi Minawa	A	Honda Connector	% Mhotronics	444 Lake Cook Rd., Suite 8	Deerfield, IL 60015	(312) 945-5600	(312) 948-5604
Mr. Kris Kowal	P	Honeywell Bull, Inc.	300 Concorde Rd.	Billerica, MA 01821		(508) 671-3333	
Mr. Andy Hospodor	O	I/O XEL	1556 Halford Ave. #316	Santa Clara, CA 95051		(408) 296-5200	
Mr. George Penokie	P	IBM Corp.	Dept. 504 Bldg. 114-2	37st Highway 52 N.	Rochester, MN 55901	(507) 253-5208	
Mr. E. W. Calkins	A	IBM Corp.	P44-097	5600 Cattle Rd.	San Jose, CA 95193	(408) 284-7222	
Mr. Gerald Marazas	A	IBM Corp.	Mail Stop 4633	P.O. Box 1328	Boca Raton, FL 33429	(305) 982-5972	
Mr. Gary R. Stephens	A	IBM Corp.	Dept 67E/060-1	9000 S. Rita Rd.	Tucson, AZ 85744	(602) 799-2246	
Mr. David A. Buesing	O	IBM Corp.	2F1/030-2	37th St. NW & Hwy 52	Rochester, MN	(507) 253-9112	

Feb 23, 1989 - X3T9.2 Active Membership sorted by Organization - Enclosure (3)

Name	S	Organization	Address1	Address2	Address3	Phone	FAX
Mr. Tony Salthouse	P	ICL	Wenlock Way	West Gorton	55901 Manchester, UK M12 5DR	61-223 1301	
Mr. R. Hallam	A	ICL	Wenlock Way	West Gorton	Manchester, UK M12 5DR		
Mr. Gene Milligan	P	IMPRIMIS/CDC	MS OKM 151	P. O. Box 12313	Oklahoma City, OK 73157	(405) 324-3070	(405) 324-3333
Mr. Gerald Houlder	A	IMPRIMIS/CDC	Mail Station MTE43G	12501 Whitewater Dr.	Minnetonka, MN 55343	(612) 936-6430	
Ms. Sharon Staples	O	Info. Resource Ctr.	Dept. 8Y21	P.O. Box 3511, Sta. C	Ottawa, Ontario K1Y 4H7		
Mr. Dean Kinard	O	Intellistor	2120 Miller Dr.	Longmont, CO 80501		(303) 678-0697	
Mr. Karl Wurstner	P	Intergraph Corp.	M/S CR1105	1 Madison Industrial Park	Huntsville, AL 35807	(205) 772-6732	
Mr. Orrin Char	A	Intergraph Corp.	1 Madison Industrial Park	Huntsville, AL 35807		(205) 772-6127	
Mr. Ivan Cowie	A	Intergraph Corp.	1 Madison Industrial Park	Huntsville, AL 35807			
Mr. Steve Kappes	P	Interphase Corp.	2925 Merrell Rd.	Dallas, TX 75229		(214) 350-9000	
Mr. Craig Scott	A	Interphase Corp.	2925 Merrell Rd.	Dallas, TX 75229		(214) 350-9000	
Mr. Mark Veteikis	A	Interphase Corp.	2925 Merrell Rd.	Dallas, TX 75229		(214) 350-9000	
Mr. Rick Donihoo	O	Interphase Corp.	2925 Merrell	Dallas, TX 75229		(214) 350-9000	
Mr. c J.	P	Iomega Corp.	1821 West 4000 South	Roy, UT 84067	Bldg. # 6	(801) 778-1000	
Mr. Geoff Barton	A	Iomega Corp.	1821 West 4000 South	Roy, UT 84067		(801) 778-1000	
Mr. Dave Goodman	P	ITT Cannon	10550 Talbert	Fountain Valley, CA 92708		(714) 964-8320	
Mr. Cliff Kahn	A	ITT Cannon	10550 Talbert	Fountain Valley, CA 92708		(714) 964-8274	
Mr. D. Shaff	P	JAE	1901 E. Carnegie Av., Suite A	Santa Ana, CA 92705-5504		(714) 250-8770	(714) 250-8957
Mr. Ken Tsukinari	A	JAE	1901 E. Carnegie Av., Suite A	Santa Ana, CA 92705-5504		(714) 250-8770	(714) 250-8957
Mr. W. Dean Wilson	A	JAE	1901 E. Carnigie	Santa Ana, CA 92705-5504		(714) 250-8770	(714) 250-8957
Mr. Y. Hayashida	O	JAE	1901 E. Carnegie Av., Suite A	Santa Ana, CA 92705-5504		(714) 250-8770	(714) 250-8957
Mr. Carl Salamon	O	JAE	1901 E. Carnegie Av., Suite A	Santa Ana, CA 92705-5504		(714) 250-8770	
Mr. Jon Miller	O	JRM Consultants Inc	P.O. Box 90310	Santa Barbara, CA 93190-0310		(805) 564-3119	
Mr. Erik Walberg	O	Konica Technology Corp.	777 N. Pastoria Ave.	Sunnyvale, CA 94086		(408) 773-9551	(408) 720-9288
Mr. Alan Ebright	P	Laserdrive Ltd.	1101 Space Park Dr.	Santa Clara, CA 95054		(408) 970-3600	(408) 727-8576
Mr. Brian Irvine	A	Laserdrive Ltd.	1101 Space Park Dr.	Santa Clara, CA 95054		(408) 970-3600	(408) 727-8576
Mr. Paul Boulay	A	LMS-OSD	4425 ArrowsWest Dr.	Colorado Springs, CO 80907		(719) 593-4323	(719) 599-8713
Mr. William Homans	P	LMS-TSD	2621 Van Buren Ave.	Norristown, PA 19403		(215) 666-4764	

Feb 23, 1989 - X3T9.2 Active Membership sorted by Organization - Enclosure (3)

Name	S	Organization	Address1	Address2	Address3	Phone	FAX
Mr. Mason Chen	0	Longshine Electronic Co.	6F No.245, Sec. 3	Roosevelt Rd.	Taipei, Taiwan R.O.C.		
Mr. Robert Bellino	0	Madison Cable Con.	125 Goddard Memorial Dr.	Worcester, MA 01603		(617) 752-7320	
Mr. Robert E. Smiley	0	MAI Basic Four	14101 Myford MD312	Tustin, CA 92680		(714) 730-2509	
Mr. David F. Craft, Jr.	0	Masscomp	1 Technology Park	Westford, MA 01886			
Mr. Kris Swanson	0	Masscomp	1 Technology Park	Westford, MA 01886			
Mr. Anthony Jasionowski	0	Matsushita Tech. Center	M/S 1F-1	One Panasonic Way	Secaucus, NJ 07094		
Mr. Swami Nathan	0	Maxon Systems, Inc.	353 Vintage Park Dr., Suite B	Foster City, CA 94404			
Mr. David Scheffey	0	Maxon Systems, Inc.	353 Vintage Park Dr., Suite B	Foster City, CA 94404		(415) 377-0202	
Mr. Lawrence J. Lamers	P	Maxtor Corp.	211 River Oaks Pkwy	San Jose, CA 95134		(408) 432-4341	(408) 434-6469
Mr. Dan Banerje	A	Maxtor Corp.	211 River Oaks Pkwy	San Jose, CA 95134		(408) 432-4452	
Mr. Skip Jones	A	Maxtor Corp.	2811 Riachuelo	San Clemente, CA 92672		(408) 432-3645	
Mr. Bob Mortensen	A	Maxtor Corp.	211 River Oaks Pkwy	San Jose, CA 95134		(408) 432-4447	(408) 434-6469
Mr. Jonathan Hubert	0	Maxtor Corp.	211 Riveroaks Pkwy	San Jose, CA 95134		(408) 432-4686	
Ms. Donna Pope	0	Maxtor Corp.	211 River Oaks Pkwy	San Jose, CA 95134		(408) 432-4455	
Mr. John Hackmann	0	McDonnell Douglas	3320 Cedar Mtn Rd.	Belleville, IL 62221		(314) 895-5296	
Mr. Bob Masterson	P	Methode Electronics, Inc.	2950 S. Jamaca, #100	Aurora, CO 80014		(303) 695-1333	
Mr. Dan Paplowski	A	Methode Electronics, Inc.	7444 West Wilson Av.	Chicago, IL 60656		(312) 867-9600	
Mr. Dave Horton	0	Micron Technology	#150	108 Wildbasin Rd.	Austin, TX 78746		
Mr. Stephen Cornaby	P	Micropolis Corp.	21211 Nordhoff St.	Chatsworth, CA 91311		(818) 718-7855	
Mr. Paul Wassenberg	A	Micropolis Corp.	21211 Nordhoff St.	Chatsworth, CA. 91311		(818) 709-3318	
Mr. Eric Yu	0	Microtek Lab. Inc.	16901 South Western Ave.	Gardena, CA 90247		(213) 321-2121	
Mr. Nick Livote	0	MILTOPE Corp.	1770 Walt Whitman Rd.	Melville, NY 11747		(516) 756-7639	
Mr. Michael Bryan	P	Miniscribe Corp.	1831 Lefthand Cr., B8-1	Longmont, CO 80501		(303) 678-2186	
Mr. John Mangan	A	Miniscribe Corp.	1861 Lefthand Cir. B11	Longmont, CO 80501		(303) 678-2391	(303) 678-2308
Mr. Kim Ryal	A	Miniscribe Corp.	1831 Lefthand Cr.	Longmont, CO 80501		(303) 678-2733	
Ms. Laura Shellhamer	0	Miniscribe Corp.	1831 Lefthand Cir. B8-1	Longmont, CO 80501		(303) 678-2506	
Mr. Daniel E. Moczarny	P	Mitsubishi Electronics Amer	991 Knox St.	Torrance, CA 90502		(213) 515-3993	
Mr. James Hamada	A	Mitsubishi Electronics Amer	991 Knox St.	Torrance, CA 90502		(213) 515-3993	
Mr. Toshio Hashimoto	0	Mitsubishi Electronics Amer	991 Knox St.	Torrance, CA 90502		(213) 515-3993	
Mr. Craig Bixler	P	Molex Inc.	2222 Wellington Court	Lisle, IL 60532		(312) 969-4550	
Mr. Irv Triner	A	Molex Inc.	2222 Wellington Ct.	Lisle, IL 60532		(312) 969-4550	
Mr. Bill Bamford	0	Molex Inc.	2222 Wellington Ct.	Lisle, IL 60532		(312) 969-4550	

Feb 23, 1989 - X3T9.2 Active Membership sorted by Organization - Enclosure (3)

Name	S	Organization	Address1	Address2	Address3	Phone	FAX
Mr. Ivor Redmonde	O	Molex International Inc.	2222 Wellington Court	Lisle, IL 60521			
Mr. Brian Wolf	O	Motorola	6501 Wm. Cannon Drive	Austin, TX 78735-8598			
Mr. Cousy Maher	O	Motorola Micro Systems	Mail Drop DW220	2900 S. Diablo Way	Tempe, AZ 85282	(602) 438-3286	
Mr. Paul Rosen	O	Motorola Micro Systems	2900 S. Diablo Way	Tempe, AZ 85282		(602) 438-3150	
Mr. William E. Burr	P	Nat. Inst. of Stnds. & Tech.	Bldg. 233, Rm B364	Gaithersburg, MD 20899		(301) 975-2914	(301) 975-2128
Mr. Liu Zuqiu	A	Nat. Inst. of Stnds. & Tech.	Room A-216, Bldg. 225	Gaithersburg, MD 20899		(301) 975-2914	
Mr. James Schuessler	P	National Semiconductor	POB 58090, M/S D-3969	2900 Semiconductor Dr.	Santa Clara, CA 95052-8090	(408) 721-6802	
Mr. Jim Johnston	A	National Semiconductor	POB 58090, M/S 3969	2900 Semiconductor Dr.	Santa Clara, CA 95052-8090	(408) 721-4822	
Mr. Gilbert Green	O	NCAR	1850 Table Mesa Dr.	Boulder, CO 80303		(303) 497-1270	
Mr. Aki Komatzuzaki	O	NCL America	1221 Innsbruck	Sunnyvale, CA 94089		(408) 734-1006	
Mr. Frank Krulc	O	NCL America	1221 Innsbruck	Sunnyvale, CA 94089		(408) 734-1006	
Mr. John Lohmeyer	P	NCR Corp.	3718 N. Rock Rd.	Wichita, KS 67226		(316) 636-8703	(316) 636-8889
Mr. Marty Francis	A	NCR Corp.	3718 N. Rock Rd.	Wichita, KS 67226		(316) 636-8000	
Mr. Fred F. Meadows	A	NCR Corp.	16550 W. Bernardo Dr.	San Diego, CA 92127		(619) 485-3228	
Mr. Harry Mason	O	NCR Corp.	1635 Aeroplaza	Col. Springs, CO 80916		(303) 596-5794	
Mr. gen Thiemann	O	NEC Deutschland GmbH	Kronstadter Strasse 30	8000 Munchen 80	West Germany	x224	
Mr. Bruce Anderson	P	NEC I.S.	1414 Massachusetts Ave.	Boxborough, MA 01719		(508) 264-8064	
Mr. Dennis R. Powell	A	NEC I.S.	1414 Massachusetts Ave.	Boxborough, MA 01719		(508) 264-8065	
Mr. John Zilinski	A	NEC I.S.	110 Rio Robles	San Jose, CA 95134		(408) 433-1390	
Ms. Joan French	O	NEC Systems Laboratory	1414 Massachusetts Ave.	Boxborough, MA 01719		(508) 262-2627	
Mr. Ken Drewlo	O	Network Systems	7600 Boone Ave. N.	Brooklyn Park, MN 55428		(612) 424-4888	
Mr. Paul K. Garretson	O	Nissei Sangyo (Hitachi)	460 E. Middlefield Rd.	Mt. View, CA 94043		(415) 969-1100	
Mr. Ron Sulyma	O	North Atlantic Industries	60 Plant Ave.	Hauppauge, NY 11788		(516) 582-6500	
Mr. David Filpus	P	Northern Telecom, Inc.	Memory Systems Division	100 Phoenix Dr., POB D	Ann Arbor, MI 48106	(313) 973-4848	
Mr. Frank Haas	A	Northern Telecom, Inc.	Memory Systems Division	100 Phoenix Dr., POB D	Ann Arbor, MI 48106	(313) 973-4000	
Mr. David Huminski	O	OKIDATA	532 Fellowship Rd.	Mt. Laurel, NJ 08054		(609) 235-2600	
Mr. Dennis P. Trupski	P	Olivetti	20300 Steven Creek Blvd.	Cupertino, CA 95014		(408) 996-3867	(408) 996-3053
Mr. Roberto Salgari	A	Olivetti	20300 Steven Creek Blvd.	Cupertino, CA 95014		(408) 996-3867	(408) 996-3053
Mr. Wayne Baldwin	O	Olivetti	20300 Stevens Creek Blvd.	Cupertino, CA 95014		(408) 996-3867	(408) 996-3053



Feb 23, 1989 - X3T9.2 Active Membership sorted by Organization - Enclosure (3)

Name	S	Organization	Address1	Address2	Address3	Phone	FAX
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Mr. Paul Nitza	P	OTL Engineering	15665 Williams #57	Tustin, CA 92680		(714) 542-1233	
Mr. Thomas Steury	O	Pacific Electro Data Inc.	14 Hughes, Suite B205	Irvine, CA 91718		(714) 770-3244	
Mr. Stephen S. Francis	O	Palantir Corp.	2455 Augustine Dr.	Santa Clara, CA 95054		(408) 986-8006	
Mr. Charles Yang	P	Panasonic Industrial Co.	1600 McCandless Dr.	Milpitas, CA 95035		(408) 262-2200	
Mr. Steve Heissenbuttel	A	Panasonic Industrial Co.	One Panasonic Way	Secaucus, NJ 07094		(201) 348-7000	
Mr. Hitoshi Watanabe	O	Panasonic Industrial Co.	1600 McCandless Dr.	Milpitas, CA 95035		(408) 262-2200	
Mr. Ed Cieniawa	P	Panduit Corp.	412 Rockwell Ct.	Burr Ridge, IL 60521		(312) 887-1000	
Mr. Robert Bender	O	Pentax Teknologies	880 Interlocken Pkwy	Broomfield, CO 80020		(303) 460-1600	(303) 460-1628
Mr. Bill Bunker	O	Pentax Teknologies	880 Interlocken Pkwy	Broomfield, CO 80020		(303) 460-1600	(303) 460-1628
Mr. Gene Johnson	O	Pentax Teknologies	880 Interlocken Pkwy	Broomfield, CO 80020		(303) 460-1607	(303) 460-1628
Mr. Mark Koch	O	Pentax Teknologies	880 Interlocken Pkwy	Broomfield, CO 80020		(303) 460-1607	(303) 460-1628
Mr. John J. Grana	O	Performance Technologies, Inc	435 W. Commercial St.	E. Rochester, NY 14445		(716) 586-6727	
Mr. David Thomas	P	Peripheral Technology Inc.	685 East Cochran St.	Simi Valley, CA 93065		(805) 581-1000	(805) 521-1054
Mr. Barry Mallett	O	Plessey Microsystems Ltd.	Water Lane, Towcester,	Northants	England NN12 7JN	(0327) 50312	x2294
Mr. John Blagaila	O	Prairie Tek	10133 North 75th Street	Longmont, CO 80501			
Mr. Robert Metz	O	PrairieTek Corp.	10133 N. 75th St.	Longmont, CO 80501		(303) 443-3788	
Mr. James A. Whitworth	P	Priam Corp.	20 West Montague Expwy	San Jose, CA 95134		(408) 434-9300	
Mr. Mike Buckert	A	Priam Corp.	20 West Montague Expwy	San Jose, CA 95134		(408) 434-9300	
Mr. Michael Fitzpatrick	P	Prime Computer, Inc.	500 Old Connecticut Path	Framingham, MA 01701		(508) 879-2960	
Mr. James McGrath	P	Quantum Corp.	1804 McCarthy Blvd.	Milpitas, CA 95035		(408) 432-1100	
Mr. Glen Nance	A	Quantum Corp.	1804 McCarthy Blvd.	Milpitas, CA 95035			
Mr. E. Slater	O	R&D	Information Technology Plc.	Maylands Av., Hemel Hempstead	Herts HP2 7DF England		
Mr. John Fobel	O	Rancho Technology, Inc.	8632 Archibald Ave, Suite 109	Rancho Cucamonga, CA 91730		(714) 987-3966	
Mr. Charlie Ghahremani	O	Raycom Systems, Inc.	#A-2	7247 Hayvenhurst Ave.	Van Nuys, CA 91406		
Dr. Tetsuro Motoyoma	P	Ricoh Corporation	1321 Ridder Park Drive	San Jose, CA 95131		(408) 432-8800	(408) 452-0243
Mr. Toshi Iizuka	A	Ricoh Corporation	5150 El Camino Real, D-20	Los Altos, CA 94022		(415) 962-0443	(415) 962-0441
Mr. Dave Koger	A	Ricoh Corporation	1321 Ridder Park Drive	San Jose, CA 95131		(408) 432-8800	
Mr. Ben Mattox	O	Robinson Nugent	800 E. 8th St.	New Albany, IN 47136		(812) 945-0211	(812) 945-0804
Mr. David Ruxton	O	RODIME LTD	Southfield	Glenrothes, Scotland		44(592)774704	
Mr. Bob Reid	P	Scientific Micro	339 N. Bernardo Ave.	P. O. Box 7777	Mtn View, CA	(415) 962-5457	



Feb 23, 1989 - X3T9.2 Active Membership sorted by Organization - Enclosure (3)

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Mr. Philip O'Leary	O	Scientific Micro Systems	339 N. Bernardo Ave.	Mountain View, CA 94039		(415) 964-5700	
Mr. D. Michael Robinson	P	Seagate Technology	920 Disc Drive	Scotts Valley, CA 95066		(408) 438-6550 x4055	
Mr. Dhisw Dera	A	Seagate Technology	920 Disc Drive	Scotts Valley, CA 95066		(408) 439-4060	
Mr. Mike Eneboe	A	Seagate Technology	920 Disc Dr.	Scotts Valley, CA 95066		(408) 439-2406	
Mr. Carter O'Brien	A	Seagate Technology	920 Disc Drive	Scotts Valley, CA 95066		(408) 438-6550	
Mr. Charles M. Schroter	A	Seagate Technology	920 Disc Drive	Scotts Valley, CA 95066		(408) 438-6550	
Mr. William K. Smythe	L	Secretary, IT8 Committee	NPES Inc.	1899 Preston White Drive	Reston, VA 22091	(703) 264-7200	
Mr. K. Ota	O	Seiko Epson Corp., 2L Group	Suwaminami Factory	1010 Fujimi-Machi, Suwa-Gun	Nagano-Ken, Japan		
Mr. Roger Shelton	O	SEQUENT Computer Systems	15450 SW Koll Parkway	Beaverton, OR 97006-6063		(503) 627-9818	
Mr. Dean Konell	P	Siemens Info. Systems, Inc.	1077 Business Center Circle	Newbury Park, CA 91320		(805) 375-2520	
Mr. Cornelius van de	O	Siemens, Communication Group	St. Martin-Strasse 76	D8000 Munich 80	West Germany	01149-81-2172-4735	
Mr. Mike Holt	O	Silicon Systems	14351 Myford Road	Tustin, CA 92680		(714) 731-7110	
Mr. Aziz Makhani	O	Silicon Systems	14351 Myford Road	Tustin, CA 92680		(714) 731-7110 x3462	
Ms. Rita Lin	P	Sony Corp. of America	15 Essex Rd. 4th Fl	Paramus, NJ 07652		(201) 368-5190	
Mr. Simon Kustedjo	P	Sony Corp. of America	15 Essex Rd. 4th Fl	Paramus, NJ 07652		(201) 368-5167	
Mr. David Cragg	O	Standard Micro Systems	35 Marcus Blvd.	Hauppauge, NY 11788		(516) 273-3100	
Mr. David Jabs	O	Stellar Computer Inc.	95 Wells Ave.	Newton, MA 02159		(617) 974-1000	
Mr. David A. Hatch	P	Stewart Connector Systems	13 Pleasant St.	Sherborn, MA 01770		(508) 655-1193	
Mr. Terry Meighen	A	Stewart Connector Systems	203 Monomoscoy Rd.	Mashpee, MA 02649		(617) 477-4403	
Mr. Dennis Appleyard	P	Storage Technology Corp.	Mail Drop 4271	2270 South 88th St.	Louisville, CO 80028-4271	(303) 673-6685	
Mr. Don McCarthy	A	Storage Technology Corp.	Mail Drop 4271	2270 South 88th St.	Louisville, CO 80028-4271	(303) 673-6417	
Mr. Steve Kohalmi	O	Stratus Computer	55 Fairbanks Blvd.	Marlboro, MA 01752		(508) 460-2853	
Mr. Curtis A. Ridgeway	P	Sun Microsystems, Inc.	2550 Garcia Ave.	Mountain View, CA 94043		(415) 336-2226	
Mr. Paul Rikonen	A	Sun Microsystems, Inc.	Two Federal Street	Billerica, MA 01821		(508) 667-0010 (508) 671-0049	

Feb 23, 1989 - X3T9.2 Active Membership sorted by Organization - Enclosure (3)

Name	S	Organization	Address1	Address2	Address3	Phone	FAX
Mr. Dexter Anderson	0	Sun Microsystems, Inc.	2550 Garcia Ave.	Mountain View, CA 94043			
Mr. Vit Novak	0	Sun Microsystems, Inc.	2550 Garcia Ave.	Mountain View, CA 94043		(415) 336-2455	
Mr. Steve Tsai	0	Sun Microsystems, Inc.	2550 Garcia Ave.	Mail Stop A5-41	Mountain View, CA 94043	(415) 691-2274	
Mr. Owen Gehlert	0	Supertek Computers, Inc.	5150 Great America Pkwy.	Santa Clara, CA 95054			
Mr. Norman Morse	0	SyQuest Technology	47923 Warm Springs Blvd.	Freemont, CA 94539		(415) 490-7511	
Mr. Joe J. Huang	0	Sysgen, Inc.	556 Gibraltar Dr.	Milpitas, CA 95035		(408) 263-4411	
Mr. Albert C. Amet	0	Tallgrass Technologies	11100 W. 82nd St.	Overland Park, KS 66214			
Mr. Frank Hannon	0	Tandem Computer Inc.	Location 100-03	10555 Ridgeview Ct.	Cupertino, CA 95014	(408) 996-6635	
Mr. Satish Shah	0	Tandem Computer Inc.	Location 100-03	10555 Ridgeview Ct.	Cupertino, CA 95014	(408) 996-6516	
Mr. Jim Smith	0	Tandem Computer Inc.	10555 Ridgeview Ct., 100-03	Cupertino, CA 95014-0789			
Mr. Tom Gardner	P	Technology Forums, Ltd.	14469 Manuella	Los Altos, CA 94022		(415) 941-5324	
Mr. Ned N. Mayrath	0	Telex Computer Products	6422 E. 41st St.	Tulsa, OK 74135		(918) 628-2370	
Mr. Gene Abel	0	TelTec, Inc.	7890 12th Avenue South	Minneapolis, MN 55425		(612) 854-9177	
Mr. Len Chansky	0	Terminal Data Corp.	2800 N. Madgra Rd.	Simi Valley, CA 93065		(805) 529-1500 x308	
Mr. D. W. Spence	P	Texas Instruments	Data Systems Division	POB 2909, MS 2091	Austin, TX 78769	(512) 250-6627	(512) 250-6539
Mr. Steven A. Justiss	A	Texas Instruments	P.O. Box 2909, M/S 2091	Austin, TX 78769		(512) 250-7561	
Mr. Jerry Laws	0	Texas Instruments	Mail Stop 2091	P.O. Box 2909	Austin, TX 78769		
Mr. Clarence Lewis	0	Texas Instruments	8390 LBJ Freeway	P.O. Box 655303 M/S 8209	Dallas, TX 75265	(214) 997-3396	
Mr. Edward R. Schurig	0	Texas Instruments	8390 LBJ Freeway	P.O. Box 655303 M/S 8209	Dallas, TX 75265		
Mr. Skip Strang	0	Texas Instruments	P. O. Box 655474	M/S 8209	Dallas, TX 75265	(214) 997-3394	
Mr. Harvey Waltersdorf	P	Thomas & Betts	1001 Frontier Road	Bridgewater, NJ 08807		(201) 707-2666	(201) 707-2145
Mr. Keith Bean	A	Thomas & Betts	1001 Frontier Rd.	Bridgewater, NJ 08807		(201) 685-1600	
Mr. Hidenori Shinoda	0	Toshiba America, Inc.	375 Park Ave., Suite 1705	New York, NY 10152			
Mr. Peter Dougherty	P	UNISYS	San Tomas & Central Exprwy	MS 12-35	Santa Clara, CA 95052	(408) 987-2214	
Mr. Floyd Ross	A	UNISYS	P.O. Box 1874	Southeastern, PA 19398		(215) 341-1542	
Mr. Robert L. Bergey	0	UNISYS	2300 Central	Santa Clara, CA 95052			

Feb 23, 1989 - X3T9.2 Active Membership sorted by Organization - Enclosure (3)

Name	S	Organization	Address1	Address2	Address3	Phone	FAX
Mr. Andrew Carroll	O	UNISYS	Expressway Tredyffrin LSG RML252 P.O. Box 203		Paoli, PA 19301		
Mr. Ernie Derkas	O	UNISYS	2476 Swedesford Rd.	Paoli, PA 19301		(215) 648-4246	(215) 648-4680
Mr. Marshall Downes	O	UNISYS	2476 Swedesford Rd.	Paoli, PA 19301		(215) 648-4469	(215) 648-4680
Mr. William G. Klehm	O	UNISYS	Burroughs Pl.	Detroit, MI 48232		(313) 972-7932	
Mr. Rama Voddi	O	UNISYS	P. O. Box 1874	Southeastern, PA 19398		(215) 341-4430	
Mr. Lou Edwards	O	Verbatim	435 Indio Way	Sunnyvale, CA 94086		(408) 773-3861	
Mr. Rod Kirk	O	Verbatim Corp.	445 Indio Way	Sunnyvale, CA 94086		(408) 773-5768	
Mr. Louis H. Sharpe	O	Vidar Systems Corp.	520 Herndon Pkwy.	Herndon, VA 22070		(703) 471-7070	
Mr. Karl Kwiat	P	Viking Connectors	21001 Nordhoff St.	Chatsworth, CA 91311		(818) 341-4330	
Mr. Peter Kurbikoff	A	Viking Connectors	21001 Nordhoff St.	Chatsworth, CA 91311		(818) 341-4330	
Ms. Darlene Dubois	O	Wang Laboratories	Corporate Accounts Payable	One Executive Dr., MS 056-11A	Chelmsford, MA 01824		
Mr. John Frissell	O	Wang Laboratories	Mail Stop 1429	1 Industrial Ave.	Lowell, MA 01852	(602) 437-9035	
Mr. David Griffith	O	Wang Laboratories	Mail Stop 014-490	1 Industrial Ave.	Lowell, MA 01852	(508) 967-2265	
Mr. Lou Domshy	O	WangDAT	3001 Redhill Ave. 4-222	Costa Mesa, CA 92626		(714) 241-9613	
Mr. Andy Millerd	O	Wangdat	3001 Redhill Ave. 4-222	Costa Mesa, CA 92626			
Mr. Kenji Eigner	O	Wangtek	41 Moreland Rd.	Simi Valley, CA 93065		(805) 583-5255	
Mr. Richard Richardson	O	Wangtek	41 Moreland Rd.	Simi Valley, CA 93065		(805) 583-5255	
Mr. Carl Warren	L	Warren Group	2980 W. 235th Apt 12	Torrance, CA 90505		(213) 530-6097	
Mr. Jeff Stai	P	Western Digital	2445 McCabe Way	Irvine, CA 92714		(714) 474-2033	(714) 553-8152
Mr. Anil Gupta	A	Western Digital	2445 McCabe Way	Irvine, CA 92714		x37137 (714) 474-2033	
Ms. Linda Strahle	O	Xylogics, Inc.	53 Third Ave.	Burlington, MA 01803		x3126 (617) 272-8140	
Mr. Peter Hexler	O	Xylogics, Inc.	144 Middlesex Tpk.	Burlington, MA 01803			
Mr. Saied Zangenehpour	O	Zenith Electronics	Hilltop Road	St. Joseph, MI 49085		(616) 982-3509	

Feb 23, 1989 - X3T9.2 Document Register Enclosure (4)

Document	Ent Date	Doc Date	Author	Description of Document
X3T9.2/89-1	1/3/89	1/3/89	J. Lohmeyer	X3T9.2 1988 Annual Report
X3T9.2/89-2	1/3/89	12/22/88	K. Kumazawa	ESDI "Index to Sector" Synchronization
X3T9.2/89-3	1/3/89	12/28/88	D. Hatch	Ltr re signal integrity testing DAISY-GEN connector/possible proposal
X3T9.2/89-4 Rev 1	1/12/89	1/30/89	P. Boulay	Proposed Single-Ended SCSI Bus Terminator
X3T9.2/89-5	1/12/89	1/6/89	K. Chan	Recommended Response Time after RST
X3T9.2/89-6	1/12/89		K. Chan	Tape Read Density Reporting
X3T9.2/89-7	1/12/89	1/7/89	P. Nitza	Terminate Immediate with Auto Sense
X3T9.2/89-8 Rev 1	1/12/89		Stephens/ Davies	"Brief" Description of Density Code operation
X3T9.2/89-9	1/12/89	1/9/89	P. Bramhill	COPY and Partitioned Tape
X3T9.2/89-10	1/12/89	1/9/89	P. Bramhill	REQUEST SENSE EOM data on Partitioned Tape
X3T9.2/89-11	1/12/89	1/9/89	P. Bramhill	MODE SELECT Device Configuration Parameters
X3T9.2/89-12 Rev 1	1/12/89	1/9/89	P. Bramhill	Separation of BOM and BOPO
X3T9.2/89-13 Rev 1	1/12/89	1/9/89	P. Bramhill	9.2.13 SPACE Command, Rev 6a, page 9-30
X3T9.2/89-14	1/12/89	1/6/89	B. Pentecost	READ POSITION Command
X3T9.2/89-15	1/12/89	1/6/89	B. Pentecost	Write with Length = 0
X3T9.2/89-16 Rev 1	1/12/89	1/10/89	P. Bramhill	Active Format field in Device Configuration Parameters Page
X3T9.2/89-17	1/12/89	1/10/89	P. Bramhill	Introduce a new optional command
X3T9.2/89-18	1/12/89	1/12/89	K. Chan	Preliminary Cable Test Results
X3T9.2/89-19 Rev 1	1/12/89	1/12/89	Lamers/ Lohmeyer	Costa Mesa Working Group Minutes
X3T9.2/89-20	1/16/89	1/4/89	R. Cummings	Fiber Optic Channel Working Group Minutes
X3T9.2/89-21	1/17/89	1/17/89	Penokie/ Clegg	Tape Read Underlength Detection
X3T9.2/89-22	1/17/89	1/6/89	L. Groenke	ISO/IEC JTC 1 Project 13.10.12 SCSI-2
X3T9.2/89-23	1/17/89	1/14/89	D. Allan	Synchronized Sector Offset for ESDI
X3T9.2/89-24	1/24/89	1/24/89	J. Lohmeyer	When not to clear sense data
X3T9.2/89-25	1/26/89	1/26/89	J. Lohmeyer	SEARCH DATA Transfer Length Inconsistency
X3T9.2/89-26	2/6/89	2/6/89	J. McGrath	March 6-8, 1989 SCSI Working Group and CAM Meeting Announcement
X3T9.2/89-27	2/14/89	2/14/89	Weber & Hoglund	ESDI Version 3.0 satisfies NCR PR comment
X3T9.2/89-28	2/14/89	2/21/89	Lamers/ Lohmeyer	X3T9.2 Meeting #80 Minutes -- February 20-21, 1989
X3T9.2/89-29	2/16/89	2/16/89	J. Lohmeyer	Letter to W.E. Burr thanking him for preparing ISO 9316:1989 (SCSI)
X3T9.2/89-30	2/22/89	2/18/89	P. Nitza	Review of SCSI-2 Revision 7
X3T9.2/89-31	2/22/89	2/10/89	B. Pentecost	DA FORMAT UNIT command, IP Modifier
X3T9.2/89-32	2/22/89	2/16/89	P. Bramhill	Comments on SCSI-2 Working Draft Rev 7
X3T9.2/89-33	2/22/89	2/17/89	D. Appleyard	Attention Condition Timing Delays
X3T9.2/89-34	2/22/89	2/17/89	D. Appleyard	No Operation Message
X3T9.2/89-35	2/22/89	2/20/89	D. Davies	Tape Read Overlength Detection w/SILI Bit
X3T9.2/89-36	2/22/89		G. Stephens	SCSI-3 Interface Definition
X3T9.2/89-37	2/22/89	2/20/89	Boulay/ Pentecost	Medium Changer Element Status Descriptors
X3T9.2/89-38	2/22/89	2/19/89	V. Novak	Preliminary Results of SCSI-2 Cable Testing
X3T9.2/89-39	2/22/89	2/20/89	Rikkonen et. al.	SCSI-2 Cable Testing Summary Report
X3T9.2/89-40	2/22/89	2/17/89	J. Morse	SCSI Cable Test Configurations