

Accredited Standards Committee*
National Committee on Information Technology Standards (NCITS)

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Project:

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Reply to: Mr. John Lohmeyer
LSI Logic Corp.
4420 ArrowsWest Dr.
Colo Spgs, CO 80907
(719) 533-7560
lohmeier@t10.org



NCITS SUBGROUP ANNUAL REPORT

Annual Report for: **T10**
Covering the Period: September 1998 to September 1999
Title of NCITS Subgroup: Lower Level Interfaces
Informal Description of Work: T10 develops standards and technical reports on I/O interfaces, particularly the Small Computer System Interface (SCSI).

I. Executive Summary

T10 continues to run smoothly with 39 approved projects. Most of the active projects are related to the SCSI-3 family of standards. T10 membership has increased slightly and is at 49 organizations.

Over the last three years, there has been a renewed interest in parallel SCSI. This is mostly due to work on the driver/receiver technology called Low-Voltage Differential (LVD). This work extends SCSI's maximum cable lengths and the maximum data rates supported with only a slight increase in costs. This work is documented in the SPI-2, SPI-3, and SPI-4 projects.

II. Projects

1. Interfaces Between Flexible Disks and Their Host Controllers

- a. Project 0052-M, Interfaces Between Flexible Disks and Their Host Controllers
- b. Target date for dpANS to NCITS:
Original target date:
Previous target date:
Current target date:
- c. Project Description: This standard has been withdrawn.
- d. Publications during the past year: none.
- e. Statement of Progress or Accomplishments During Year: T10 requested that this standard be withdrawn. The ISO standard, A/I 9315:1989[1994], remains active.
- f. Statement of Status as of This Report: Withdrawn.

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NCITS Secretariat, Information Technology Industry Council (ITI)
1250 Eye Street NW, Suite 200, Washington, DC 20005-3922
Email: ncits@itic.nw.dc.us Telephone: 202-737-8888 FAX: 202-638-4922

- g. Future Plans: none.
- h. Reasons for Delay: none.

2. Storage Module Interfaces (SMD-E)

- a. Project 0053-RF Storage Module Interfaces (SMD-E)
- b. Target date for dpANS to NCITS:
 - Original target date:
 - Previous target date:
 - Current target date: Maintenance Phase -- 5yr review due in 2002.
- c. Project Description: This is a maintenance project on X3.91-1992, Storage Module Interfaces.
- d. Publications during the past year: none.
- e. Statement of Progress or Accomplishments During Year: Reaffirmed in 1997.
- f. Statement of Status as of This Report: Maintenance Phase.
- g. Future Plans: none.
- h. Reasons for Delay: none.

3. Small Computer System Interface (SCSI-2)

- a. Project 0375-R, Small Computer System Interface (SCSI-2)
- b. Target date for dpANS to NCITS:
 - Original target date:
 - Previous target date:
 - Current target date: Maintenance Phase -- 5yr review due in 1999.
- c. Project Description: The SCSI protocol is designed to provide an efficient peer-to-peer I/O bus with up to 16 devices, including one or more hosts. Data may be transferred asynchronously at rates that only depend on device implementation and cable length. Synchronous data transfers are supported at rates up to 10 mega-transfers per second. With the 32-bit wide data transfer option, data rates of up to 40 megabytes per second are possible.

SCSI-2 includes command sets for magnetic and optical disks, tapes, printers, processors, CD-ROMs, scanners, medium changers, and communications devices.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: T10 recommended that NCITS reaffirm X3.131-1994.
- f. Statement of Status as of This Report: Maintenance Phase -- 5yr review due in 1999.
- g. Future Plans: none for SCSI-2; work continues on the SCSI-3 family of standards.
- h. Reasons for Delay: none.

4. Enhanced Small Device Interface (ESDI)

- a. Project 0587-M, Enhanced Small Device Interface (ESDI)
- b. Target date for dpANS to NCITS:
Original target date:
Previous target date:
Current target date: Maintenance Phase -- 5yr review due in 1999.
- c. Project Description: This is a maintenance project on X3.170-1990[1994]/X3.170a-1991[1994].
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: T10 has recommended that NCITS withdraw this standard.
- f. Statement of Status as of This Report: This standard should have been withdrawn in early 1999.
- g. Future Plans: none.
- h. Reasons for Delay: none.

5. SCSI Common Access Method (SCSI CAM)

- a. Project 0792-M, SCSI Common Access Method (SCSI CAM)
- b. Target date for dpANS to NCITS:
Original target date:
Previous target date:
Current target date: Maintenance Phase -- 5yr review due in 2001.
- c. Project Description: This project defines a common method to access SCSI devices through a standard software interface to SCSI host adapters for several popular operating systems. This should result in simplified integration of products.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: ANSI X3.232-1996 published.
- f. Statement of Status as of This Report: Maintenance Phase.
- g. Future Plans: CAM-3 (Project 0990-D) is in development phase.
- h. Reasons for Delay: none.

6. SCSI-3 Parallel Interface (SPI)

- a. Project 0855-D, SCSI-3 Parallel Interface (SPI)
- b. Target date for dpANS to NCITS:
Original target date:
Previous target date:
Current target date: Maintenance Phase -- 5yr review due in 2000.

- c. Project Description: The SCSI-3 Parallel Interface standard maintains a high degree of compatibility with SCSI-2 while providing documentation for new capabilities including an option to permit 16-bit data transfers on a single cable and expanded bus connectivity options to increase the maximum number of SCSI devices on a cable from 8 to 16 or more. This standard does not address areas above the physical level (such as protocol and command sets). This standard is used in conjunction with the command sets defined in SCSI-2 and/or subsequent versions of SCSI.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: T10 has recommended that this standard be withdrawn in favor of SPI-2, X3.302:1999.
- f. Statement of Status as of This Report: The public review to withdraw SPI closes 9 Nov 99.
- g. Future Plans: SPI-3 (Project 1302-D) is in development phase and SPI-4 (Project 1365-D) has been authorized.
- h. Reasons for Delay: none.

7. **SCSI-3 Interlocked Protocol (SIP)**

- a. Project 0856-D, SCSI-3 Interlocked Protocol (SIP)
- b. Target date for dpANS to NCITS:
Original target date:
Previous target date:
Current target date: Maintenance Phase -- 5yr review due in 2002.
- c. Project Description: The SCSI-3 Interlocked Protocol standard maintains a high degree of compatibility with the equivalent functions in SCSI-2 while defining several new features and functions. The candidate new features are support of more than 8 devices and other evolutionary features. This standard is intended to be used in conjunction with the SCSI-3 Parallel Interface standard and the SCSI-3 command set standards.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: T10 has recommended that this standard be withdrawn in favor of SPI-2, X3.302:1999.
- f. Statement of Status as of This Report: The public review to withdraw this standard closes October 24, 1999.
- g. Future Plans: No follow-on projects are planned for SIP because both SPI-2 and SPI-3 integrate the SIP functions.
- h. Reasons for Delay: none.

8. **Serial Storage Architecture - Transport Layer - 1 (SSA-TL1)**

- a. Project 0989-D, Serial Storage Architecture - Transport Layer (SSA-TL1)
- b. Target date for dpANS to NCITS:
Original target date:
Previous target date:
Current target date: Maintenance Phase -- 5yr review due in 2001.

- c. Project Description: The SSA-TL1 standard will define a transport layer that uses the SSA physical layer to transport the protocol above it. The goals of SSA-TL1 are: 1) minimize gate count. 2) define a web that supports frame multiplexing. 3) define flow control that allows a tradeoff between distance and data rate. and 4) define a full duplex transfer mechanism.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: none.
- f. Statement of Status as of This Report: Published.
- g. Future Plans: SSA-TL2 (Project 1147-D) was completed.
- h. Reasons for Delay: Completed ahead of schedule.

9. Common Access Method - 3 (CAM-3)

- a. Project 0990-D, Common Access Method - 3 (CAM-3)
- b. Target date for dpANS to NCITS:
 - Original target date: July 1994
 - Previous target date: July 1996
 - Current target date: November 1999 (optimistic)
- c. Project Description: This project is intended to revise and enhance the SCSI Common Access Method (CAM) such as adding 64-bit addressing and additional queuing modes.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: Almost none -- there was one ad hoc meeting in June 1999 to discuss strategies to complete this project.
- f. Statement of Status as of This Report: Progress continues to be slow. There is almost no interest in this project, except from the project editor.
- g. Future Plans: none.
- h. Reasons for Delay: Lack of interest.

10. SCSI-3 Generic Packetized Protocol (GPP)

- a. Project 0991-DT, SCSI-3 Generic Packetized Protocol (GPP)
- b. Target date for dpANTR to NCITS:
 - Original target date:
 - Previous target date:
 - Current target date: Maintenance Phase -- 5yr review due in 2002.
- c. Project Description: The Generic Packetized Protocol is intended to provide a protocol that can take advantage of multiple physical interfaces in a length-independent manner (i.e., a minimum number of packets per I/O Process). The Generic Packetized Protocol encapsulates the SCSI protocol, functions, commands, status, and data requiring minimal services from the physical interface. This project was converted from a Standards project to a Technical Report project about a year ago.

- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: none.
- f. Statement of Status as of This Report: Published.
- g. Future Plans: none.
- h. Reasons for Delay: none.

11. **SCSI-3 Fibre Channel Protocol (FCP)**

- a. Project 0993-D, SCSI-3 Fibre Channel Protocol (FCP)
- b. Target date for dpANS to NCITS:
 - Original target date:
 - Previous target date:
 - Current target date: Maintenance Phase -- 5yr review due in 2001.
- c. Project Description: The SCSI-3 Fibre Channel Protocol is intended to provide a protocol that can take advantage of the capabilities provided by the Fibre Channel physical layer to support an efficient, low-overhead transport service for SCSI products. The FCP is one of the protocols used in the FC-4 layer of Fibre Channel.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: none.
- f. Statement of Status as of This Report: Published.
- g. Future Plans: FCP-2 (Project 1144-D) is in development phase.
- h. Reasons for Delay: none.

12. **SCSI-3 Architecture Model (SAM)**

- a. Project 0994-D, SCSI-3 Architecture Model (SAM)
- b. Target date for dpANS to NCITS:
 - Original target date:
 - Previous target date:
 - Current target date: Maintenance Phase -- 5yr review due in 2001.
- c. Project Description: The SCSI-3 Architecture Model defines the architecture of SCSI and provides a model for implementing several protocols on a variety of transport mechanisms. This standard will define a unifying framework for the implementation of SCSI.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: none..
- f. Statement of Status as of This Report: Published.
- g. Future Plans: SAM-2 (Project 1157-D) is in development phase.

- h. Reasons for Delay: none.

13. SCSI-3 Primary Commands (SPC)

- a. Project 0995-D, SCSI-3 Primary Commands (SPC)
- b. Target date for dpANS to NCITS:
 - Original target date:
 - Previous target date:
 - Current target date: Maintenance Phase -- 5yr review due in 2001.
- c. Project Description: The SPC is intended to provide a definition of those commands absolutely necessary to function in an SCSI environment plus those commands that are defined consistently for more than one command set. This command set will provide the means to identify the device type and hence identify which command set is appropriate for the device.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: none.
- f. Statement of Status as of This Report: Published.
- g. Future Plans: SPC-2 (Project 1236-D) is in development phase.
- h. Reasons for Delay: none.

14. SCSI-3 Block Commands (SBC)

- a. Project 0996-D, SCSI-3 Block Commands (SBC)
- b. Target date for dpANS to NCITS:
 - Original target date:
 - Previous target date:
 - Current target date: Maintenance Phase -- 5yr review due in 2003.
- c. Project Description: The SCSI-3 Block Commands is intended to provide a complete set of commands to complement the SCSI-3 Primary Commands, and will be applicable to devices which transfer data in fixed block sizes (e.g., disk drives).
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: none.
- f. Statement of Status as of This Report: Published.
- g. Future Plans: SBC-2 project may be proposed and RBC (Project 1240-D), which subsets the SBC command set, is in approval phase.
- h. Reasons for Delay: none.

15. SCSI-3 Stream Commands (SSC)

- a. Project 0997-D, SCSI-3 Stream Commands (SSC)

- b. Target date for dpANS to NCITS:
 Original target date: June 1994
 Previous target date: November 1998
 Current target date: November 1999
- c. Project Description: The SCSI-3 Stream Commands is intended to provide a complete set of commands to complement the SCSI-3 Primary Commands, and be applicable to devices which transfer data in a streaming manner (e.g., tape drives).
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: T10 letter ballot comments were resolved.
- f. Statement of Status as of This Report: We expect to forward SSC to NCITS late this year.
- g. Future Plans: An SSC-2 project will likely be proposed.
- h. Reasons for Delay: Workload issues with the project editors -- we are on our third project editor who appears likely to complete the project.

16. SCSI-3 Medium Changer Commands (SMC)

- a. Project 0999-D, SCSI-3 Medium Changer Commands (SMC)
- b. Target date for dpANS to NCITS:
 Original target date:
 Previous target date:
 Current target date: Maintenance Phase -- 5yr review due in 2003.
- c. Project Description: The SCSI-3 Medium Changer Commands is intended to provide a complete set of commands to complement the SCSI-3 Primary Commands, and be applicable to devices which can relocate data from an inventory location to and from a device.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: none.
- f. Statement of Status as of This Report: Published.
- g. Future Plans: An SMC-2 project may be proposed.
- h. Reasons for Delay: none.

17. SCSI-3 Controller Commands (SCC)

- a. Project 1047-D, SCSI-3 Controller Commands (SCC)
- b. Target date for dpANS to NCITS:
 Original target date:
 Previous target date:
 Current target date: Maintenance Phase -- 5yr review due in 2002.

- c. Project Description: The SCSI-3 Controller Commands standard is intended to provide a complete set of commands to complement the SCSI-3 Primary Command Set, and be applicable to devices which act as subsystem controllers, such as a disk array controllers.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: T10 has recommended that NCITS withdraw this standard in favor of SCC-2, NCITS.318:1998.
- f. Statement of Status as of This Report: Published.
- g. Future Plans: none.
- h. Reasons for Delay: none.

18. SCSI-3 Multimedia Commands (MMC)

- a. Project 1048-D, SCSI-3 Multimedia Commands (MMC)
- b. Target date for dpANS to NCITS:
 - Original target date:
 - Previous target date:
 - Current target date: Maintenance Phase -- 5yr review due in 2002.
- c. Project Description: The SCSI-3 Multimedia Commands standard is intended to provide, in conjunction with the SCSI-3 Primary Commands (SPC), a complete set of commands for CD devices, while maintaining a high degree of compatibility with SCSI-2 compliant CD-ROM devices.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: none.
- f. Statement of Status as of This Report: Published.
- g. Future Plans: MMC-2 (Project 1228-D) is in approval phase and MMC-3 (Project 1363-D) is in development phase.
- h. Reasons for Delay: none.

19. Serial Storage Architecture - SCSI-3 Protocol (SSA-S3P)

- a. Project 1051-D, Serial Storage Architecture - SCSI-3 Protocol (SSA-S3P)
- b. Target date for dpANS to NCITS:
 - Original target date:
 - Previous target date:
 - Current target date: Maintenance Phase -- 5yr review due in 2003.
- c. Project Description: The SSA-S3P standard will define a protocol that maps the SCSI-3 command sets onto the transport layer and physical interface. This standard will maintain compatibility with SCSI-3 and the SCSI-3 Architecture Model. The goals of SSA-S3P are:
 - a) support for dual port and alternate paths;
 - b) support for data field format extensions;
 - c) support for auto-sense;
 - d) support for third-party operations.
- d. Publications During Past Year: none.

- e. Statement of Progress or Accomplishments During Year: none.
- f. Statement of Status as of This Report: Published.
- g. Future Plans: none.
- h. Reasons for Delay: none.

20. SCSI-3 Fast-20 Parallel Interface (Fast-20)

- a. Project 1071-D, SCSI-3 Fast-20 Parallel Interface (Fast-20)
- b. Target date for dpANS to NCITS:
 - Original target date:
 - Previous target date:
 - Current target date: Maintenance Phase -- 5yr review due in 2001.
- c. Project Description: The Fast-20 standard is intended to document extensions to SPI to permit transfer rates of 20 mega-transfers per second, while maintaining a high degree of compatibility with SPI.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: none.
- f. Statement of Status as of This Report: T10 has recommended that NCITS withdraw this standard in favor of SPI-2, X3.302:1999.
- g. Future Plans: SPI-3 (Project 1302-D) is near the end of development phase and SPI-4 (Project 1365-D) is starting development phase.
- h. Reasons for Delay: none.

21. Serial Storage Architecture - SCSI-2 Protocol (SSA-S2P)

- a. Project 1121-D, Serial Storage Architecture - SCSI-2 Protocol (SSA-S2P)
- b. Target date for dpANS to NCITS:
 - Original target date:
 - Previous target date:
 - Current target date: Maintenance Phase -- 5yr review due in 2001.
- c. Project Description: The SSA-S2P standard will define a protocol that maps the SCSI-2 command sets onto the transport layer and physical interface. This standard will maintain compatibility with SCSI-2 to the extent possible in a serial environment. The goals of SSA-S2P are:
 - a) provide an easy migration path to a serial interface;
 - b) minimize the impact in converting firmware in existing devices;
 - c) provide an architected error recovery mode;
 - d) improve performance by reducing command overhead;
 - e) define the data field format;
 - f) provide the support needed for concurrent I/O processing.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: none.
- f. Statement of Status as of This Report: Published.

- g. Future Plans: SSA-S3P (Project 1051-D) was completed. No further SSA work is planned.
- h. Reasons for Delay: none.

22. SCSI Parallel Interface - 2 (SPI-2)

- a. Project 1142-D, SCSI Parallel Interface - 2 (SPI-2)
- b. Target date for dpANS to NCITS:
 - Original target date:
 - Previous target date:
 - Current target date: Maintenance Phase -- 5yr review due in 2004.
- c. Project Description: The SPI-2 standard will define a physical and protocol layers that will support the SCSI-3 command sets above it, while maintaining a high degree of compatibility with the current SPI and SIP standards. Candidates for inclusion in the SPI-2 draft standard are: 1) definition of a new driver/receiver technology to increase data rates, enhance signal margins, enhance cable lengths, and increase device counts; 2) enhancements to the physical layer to reduce power consumption and to address emerging market for lower voltage devices; 3) Maintenance of the SCSI physical level standard that may result from further implementation of the SPI standard.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: Project completed.
- f. Statement of Status as of This Report: Published.
- g. Future Plans: SPI-3 (Project 1302-D) is near the end of development phase and SPI-4 (Project 1365-D) is starting development phase.
- h. Reasons for Delay: none.

23. SCSI Enhanced Parallel Interface Technical Report (EPI)

- a. Project 1143-D, SCSI Enhanced Parallel Interface Technical Report (EPI)
- b. Target date for dpANS to NCITS:
 - Original target date:
 - Previous target date:
 - Current target date: Maintenance Phase -- 5yr review due in 2004.
- c. Project Description: This technical report will address complex physical configurations of parallel SCSI having one or more of the following features: a) mixed single-ended and differential devices on separate segments of the same logical bus; b) higher device count (e.g. > 16 devices); c) physical bus segments with branches to improve transmission line effects; d) extended physical bus segment lengths allowed by the propagation delay assumptions already built into the parallel SCSI protocol; e) removal and replacement of devices on active buses; f) removal, replacement, and addition of physical bus segments in active systems; g) mixed power conditions in active systems.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: Project completed.

- f. Statement of Status as of This Report: Published.
- g. Future Plans: none.
- h. Reasons for Delay: Priority was given to SPI-2 development.

24. SCSI Fibre Channel Protocol - 2 (FCP-2)

- a. Project 1144-D, SCSI Fibre Channel Protocol - 2 (FCP-2)
- b. Target date for dpANS to NCITS:
 - Original target date: November 1997
 - Previous target date: November 1999
 - Current target date: May 2000
- c. Project Description: The FCP-2 standard will define a mapping layer for the execution of SCSI operations as defined by the SCSI-3 Architectural Model, ANSI X3.270-199X on the Fibre Channel - Physical and Signaling Interface as defined by ANSI X3.230-1994. It will maintain a high degree of compatibility with the present FCP standard. Candidates for inclusion in the FCP-2 draft standard include defining an optional response confirmation protocol for certain Fibre Channel Class 3 environments.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: This draft standard is nearing completion.
- f. Statement of Status as of This Report: In development.
- g. Future Plans: none.
- h. Reasons for Delay: Dealing with error handling in an environment where out-of-order delivery may occur took longer than expected.

25. Serial Storage Architecture - Physical Layer - 1 (SSA-PH1)

- a. Project 1145-D, Serial Storage Architecture - Physical Layer (SSA-PH1)
- b. Target date for dpANS to NCITS:
 - Original target date:
 - Previous target date:
 - Current target date: Maintenance Phase -- 5yr review due in 2001.
- c. Project Description: The SSA-PH1 standard will define a physical layer that will support the SSA transport layer and the protocol above it. The goals of SSA-PH1 are: a) minimize gate count; b) copper cable operation at 20MB/sec.; c) full duplex operation to achieve an aggregate 40MB/sec between two ports; d) connectors and cables sized for small form factor devices.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: none.
- f. Statement of Status as of This Report: Published.
- g. Future Plans: SSA-PH2 (Project 1146-D) was completed. No further SSA work is planned.

h. Reasons for Delay: none.

26. Serial Storage Architecture - Physical Layer - 2 (SSA-PH2)

a. Project 1146-D, Serial Storage Architecture - Physical Layer (SSA-PH2)

b. Target date for dpANS to NCITS:

Original target date:

Previous target date:

Current target date: Maintenance Phase -- 5yr review due in 2003.

c. Project Description: The SSA-PH2 standard will define a physical layer that will support the SSA transport layer and the protocol above it. The goals of SSA-PH2 are: a) extend the cable distance; b) copper cable operation at 40MB/sec or greater; c) full duplex operation to achieve an aggregate 80MB/sec between two ports; and d) consider an optical transmission option.

d. Publications During Past Year: none.

e. Statement of Progress or Accomplishments During Year: none.

f. Statement of Status as of This Report: Published.

g. Future Plans: none.

h. Reasons for Delay: none.

27. Serial Storage Architecture - Transport Layer - 2 (SSA-TL2)

a. Project 1147-D, Serial Storage Architecture - Transport Layer (SSA-TL2)

b. Target date for dpANS to NCITS:

Original target date:

Previous target date:

Current target date: Maintenance Phase -- 5yr review due in 2003.

c. Project Description: The SSA-TL2 standard will define a transport layer that uses the SSA physical layer to support the protocol above it. The goals of SSA-TL2 are: a) provide support for an extended distance option in the physical layer; b) provide support for higher data rates in the physical layer; and c) enhance packet formats and addressing methods.

d. Publications During Past Year: none.

e. Statement of Progress or Accomplishments During Year: none.

f. Statement of Status as of This Report: Published.

g. Future Plans: none.

h. Reasons for Delay: none.

28. SCSI Serial Bus Protocol 2 (SBP-2)

a. Project 1155-D, SCSI Serial Bus Protocol 2 (SBP-2)

- b. Target date for dpANS to NCITS:
Original target date:
Previous target date:
Current target date: Maintenance Phase -- 5yr review due in 2002.
- c. Project Description: The SBP-2 standard will define transport layer protocols to take advantage of the continued evolution of the High Performance Serial Bus, IEEE Std 1394-1995. Candidates for inclusion in the SBP-2 draft standard are: a) define a transport protocol that is independent of the command set, b) develop functional specifications for SBP-2 high-availability factors, possibly in connection with yet to be defined extensions to High Performance Serial Bus transport media, c) provide functionality to incorporate the anticipated inclusion of gigabit and greater transfer rates by High Performance Serial Bus, d) insure SBP-2 compatibility for operations within a group of High Performance Serial Buses connected by bridges, e) provision of facilities to take advantage of the isochronous data transfer capabilities of High Performance Serial Bus, and f) other capabilities which fit within the general application scope of High Performance Serial Bus that may be proposed during the development phase by the participants in the project.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: Project completed.
- f. Statement of Status as of This Report: Published.
- g. Future Plans: There may be a need for an SBP-3 project; there has been some discussion over whether such a project should be proposed for T10 or IEEE.
- h. Reasons for Delay: none.

29. SCSI Architecture Model - 2 (SAM-2)

- a. Project 1157-D, SCSI Architecture Model - 2 (SAM-2)
- b. Target date for dpANS to NCITS:
Original target date: November 1997
Previous target date: November 1999
Current target date: May 2000
- c. Project Description: The SAM-2 standard will define an abstract layered model specifying those common characteristics of an SCSI I/O subsystem that must be exhibited by all SCSI protocols and implementations to insure compatibility with device drivers and applications regardless of underlying interconnect technology. SAM-2 will maintain a high degree of compatibility with the present SAM standard. Candidates for inclusion in the SAM-2 draft standard include extensions to support high availability requirements.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: Project is nearing completion.
- f. Statement of Status as of This Report: In development.
- g. Future Plans: It is likely that a SAM-3 project will be proposed.
- h. Reasons for Delay: none.

30. SCSI Enclosure Services (SES)

- a. Project 1212-D, SCSI Enclosure Services (SES)
- b. Target date for dpANS to NCITS:
Original target date:
Previous target date:
Current target date: Maintenance Phase -- 5yr review due in 2003.
- c. Project Description: The SES standard will define a model for a SCSI Enclosure Services device type. The command set and command set usage will be described. Formats for providing different classes of information will be defined. Formats for providing status and control information for each element and type of element in an enclosure are defined. The SES standard will use commands defined in the SPC standard to transfer these formats. Additional formats are provided for other enclosure related information. If the committee requests and approves appropriate text, the SES standard may include additional enclosure related information, including MIB/MIFs for enclosure information.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: none.
- f. Statement of Status as of This Report: Published.
- g. Future Plans: none.
- h. Reasons for Delay: none.

31. SCSI High Availability Profile (HAP)

- a. Project 1224-DT, SCSI High Availability Profile (HAP) Technical Report
- b. Target date for dpANTR to NCITS:
Original target date:
Previous target date:
Current target date: Project closed at T10's request.
- c. Project Description: Candidates for inclusion in the HAP technical report are: a) An interoperability profile for parallel SCSI components; b) System-level considerations for High Availability subsystems; c) Clarify the SCC description of the use of multi-LUN devices; d) Clarify device identification procedures in the case of multiple access paths; e) Identify characteristics needed for devices intended for use in high availability systems, including hardware, software, microcode, and device models; f) Document the process and procedures used to remove and replace device and host enclosures on a SCSI bus; g) Document the proper usage of "Y" cables, location of bus terminators, etc. as applicable to high availability systems; h) Document methods to avoid bus glitches on power cycles; i) Document when a bus reset may be used, when bus options are renegotiated, how to handle incoming bus resets, and the handling of message and command traffic when a host is running its boot or console code; j) Document when certain data needs to be maintained on a per-LUN or a per-host basis in a device; k) Establish guidelines for hosts in a multi-host environment to coordinate the use of mode pages, bus IDs, bus resets, and reservations; l) Clarification of the use of multiple internal controllers inside a SCSI device to provide internal protection against device failure.
- d. Publications During Past Year: none.

- e. Statement of Progress or Accomplishments During Year: none.
- f. Statement of Status as of This Report: Project closed.
- g. Future Plans: none.
- h. Reasons for Delay: none.

32. SCSI Controller Commands - 2 (SCC-2)

- a. Project 1225-D, SCSI Controller Commands (SCC-2)
- b. Target date for dpANS to NCITS:
 - Original target date:
 - Previous target date:
 - Current target date: Maintenance Phase -- 5yr review due in 2003.
- c. Project Description: The SCSI Controller Commands-2 standard is intended to provide a complete set of commands to complement the SCSI-3 Primary Command Set, and be applicable to devices which act as subsystem controllers, such as a disk array controllers. Functions which will be considered for incorporation include: a) Transfer commands unique to SCC-2 devices; b) Control commands to manage the operation of an SCC-2 device; c) Optional device mapping and pass-through support; d) Other capabilities which fit within the general scope of implementing the SCSI Controller Commands-2 on a broad range of applications, and other capabilities that may be proposed during the development phase by the participants in the project.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: Project completed.
- f. Statement of Status as of This Report: Published.
- g. Future Plans: none.
- h. Reasons for Delay: none.

33. Multi-Media Commands - 2 (MMC-2)

- a. Project 1228-D, Multi-Media Commands - 2 (MMC-2)
- b. Target date for dpANS to NCITS:
 - Original target date: March 1998
 - Previous target date: November 1999
 - Current target date: July 1999
- c. Project Description: The SCSI Multi-Media Commands-2 standard is intended to provide additional commands to existing Multi-Media Command Set, and be applicable to new devices being developed. Functions which will be considered for incorporation include: a) New Format commands unique to DVD, PD devices; b) Other capabilities which fit within the general scope of implementing the SCSI Multi-Media Commands-2 on a broad range of applications, and other capabilities that may be proposed during the development phase by the participants in the project.
- d. Publications During Past Year: none.

- e. Statement of Progress or Accomplishments During Year: Development completed; in approval phase.
- f. Statement of Status as of This Report: At first public review (closes 24 Oct 1999).
- g. Future Plans: An MMC-3 (Project 1363-D) has been started.
- h. Reasons for Delay: none.

34. SCSI Primary Commands - 2 (SPC-2)

- a. Project 1236-D, SCSI Primary Commands - 2 (SPC-2)
- b. Target date for dpANS to NCITS:
 - Original target date: July 1998
 - Previous target date: November 1999
 - Current target date: May 2000
- c. Project Description: The SCSI Primary Commands-2 standard is intended to include additional commands as well as existing SCSI-3 Primary Commands, and be applicable to both existing and new SCSI device types being developed. The participants in the project may decide to move some information in SCSI-3 Primary Commands to another standard or to make some information in SCSI-3 Primary Commands obsolete in SCSI Primary Commands-2. In addition to the information currently in SCSI-3 Primary Commands, information that will be considered for incorporation include: a) New additional sense code values; b) New mode page definitions or new fields in existing mode pages; c) New fields in the parameter data returned by the INQUIRY and REQUEST SENSE commands; d) New vital product data pages; e) New commands appropriate for all SCSI device types; f) Changes to the processor device type model; and g) Other capabilities that fit within the general scope of implementing the SPC-2 on a broad range of applications, and other capabilities that may be proposed during the development phase by the participants in the project.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: Project nearing completion.
- f. Statement of Status as of This Report: In development.
- g. Future Plans: An SPC-3 project will probably be proposed in order to forward SPC-2.
- h. Reasons for Delay: It seems necessary to keep an SPC-n project open as long as other command sets projects are open.

35. Reduced Block Commands (RBC)

- a. Project 1240-D, Reduced Block Commands (RBC)
- b. Target date for dpANS to NCITS:
 - Original target date: May 1999
 - Previous target date:
 - Current target date: March 1999
- c. Project Description: This standard will define for hard disk drive and removable disk drive devices: the commands to be utilized; the device operation; the subset of the SBP-2 protocol to be utilized; the security requirements on 1394; the configuration ROM and CSR requirements on 1394.

- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: Development phase completed and approval phase nearly complete.
- f. Statement of Status as of This Report: At second public review (closes 24 Oct 1999).
- g. Future Plans: none.
- h. Reasons for Delay: RBC was forwarded ahead of schedule.

36. SCSI Socket/SSL Services Command Set (SSS)

- a. Project 1246-D, SCSI Socket/SSL Services Command Set (SSS)
- b. Target date for dpANS to NCITS:
 - Original target date:
 - Previous target date:
 - Current target date: Project closed at T10's request.
- c. Project Description: The SSS standard will: a) define a platform and device independent method of communication between processor devices and communication devices or other devices; b) be optimized for platform/device independence; c) provide other capabilities which fit within the general application scope of the SCSI Socket/SSL Service that may be proposed during the development phase by the participants in the project.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: none.
- f. Statement of Status as of This Report: Project closed.
- g. Future Plans: none.
- h. Reasons for Delay: none.

37. SCSI Parallel Interface - 3 (SPI-3)

- a. Project 1302-D, SCSI Parallel Interface - 3 (SPI-3)
- b. Target date for dpANS to NCITS:
 - Original target date: May 1999
 - Previous target date: May 1999
 - Current target date: January 2000
- c. Project Description: The SPI-3, based on low-voltage differential (LVD) technology, will allow a 32-bit dual-channel host adapter to attain greater than 5 Gbits per second data rate, doubling the data rate of current technology. This will permit peripherals to meet the data I/O needs of the next generation 64-bit processors being delivered by the end of the millennium. In addition to improving the fundamental data rate to 80 mega-transfers per second, SPI-3 will consider reducing the overhead of parallel SCSI with the adoption of protocol enhancements allowing a host adapter achievement of greater than 100,000 I/O's per second. The enhancements may include an error detection scheme along with packetization to increase the data integrity and provide unrestricted hot plugging for parallel SCSI. The SPI-3 project will consider the advancing developments in silicon technology related to power management and voltage-reduction.

- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: Development phase nearly complete.
- f. Statement of Status as of This Report: In development.
- g. Future Plans: SPI-4 (Project 1365-D) has been started.
- h. Reasons for Delay: none.

38. SCSI Enclosure Profile (SEP) Technical Report

- a. Project 1303-D, SCSI Enclosure Profile (SEP)
- b. Target date for dpANS to NCITS:
 - Original target date: May 1999
 - Previous target date:
 - Current target date: Project closed at T10's request.
- c. Project Description: With the near completion of SES (SCSI Enclosure Services) and SCC-2 (SCSI Controller Commands -2) standards, product developers need guidance for cost-effective engineering of RAID (Redundant Arrays of Independent Disks) products based on these new standards. It is important that both host software and RAID controller firmware be developed at minimum time and cost so that initial industry acceptance of these new standards can be achieved. A usage profile describing a minimum usage definition based on the standards and agreed to using the NCITS consensus process is proposed to meet these needs.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: none.
- f. Statement of Status as of This Report: Project closed.
- g. Future Plans: none.
- h. Reasons for Delay: none.

39. Multi-Media Commands - 3 (MMC-3)

- a. Project 1363-D, Multi-Media Commands - 3 (MMC-3)
- b. Target date for dpANS to NCITS:
 - Original target date: November 2000
 - Previous target date:
 - Current target date: November 2000
- c. Project Description: The MultiMedia Command set version 3 is based on MultiMedia Command set version 2 that provides for commands to implement CD-R, CD-RW, DVD-ROM, DVD-R, DVD+RW DVD-RAM, DVD-RW, AS-MO, and earlier devices. This command set may be implemented on multiple interfaces such as SCSI, ATA/ATAPI, SBP-2 (1394), and FC-P. The following items should be considered for inclusion in MMC-3: 1) options for improving operation with serial interconnects; 2) extensions to DVD product commands; 3) extensions to CD product commands; 4) other capabilities that may fit within the general application scope of this project.
- d. Publications During Past Year: none.

- e. Statement of Progress or Accomplishments During Year: Development phase just started.
- f. Statement of Status as of This Report: In development.
- g. Future Plans: none.
- h. Reasons for Delay: none.

40. **Reduced MultiMedia Command Set (RMC)**

- a. Project 1364-D, Reduced MultiMedia Command Set (RMC)
- b. Target date for dpANS to NCITS:
 - Original target date: November 2000
 - Previous target date:
 - Current target date: November 2000
- c. Project Description: The Reduced MultiMedia command set is based on MultiMedia Command Set – 2 (MMC-2), and the Reduced Block Command (RBC) Set for SBP-2. It will provide for a reduced number of commands that will ensure all functions of the CD/DVD will be implemented. The following items should be considered for inclusion in RMC: 1) extensions for minimal command implementation; 2) ensure that the latest CD/DVD products have valid commands; 3) other capabilities that may fit within the general application scope of the this project.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: Development phase just started.
- f. Statement of Status as of This Report: In development.
- g. Future Plans: none.
- h. Reasons for Delay: none.

41. **SCSI Parallel Interface - 4 (SPI-4)**

- a. Project 1365-D, SCSI Parallel Interface - 4 (SPI-4)
- b. Target date for dpANS to NCITS:
 - Original target date: November 2000
 - Previous target date:
 - Current target date: November 2000
- c. Project Description: The SCSI Parallel Interface - 4 (SPI-4), is based on low-voltage differential (LVD) technology and is designed to provide a 320 MB/sec data rate and lay the groundwork for the next data rate, 640 MB/sec. In addition to doubling the existing data rate of SPI-3, the following items may be considered for inclusion in SPI-4: 1) extended addressing for multi-segment domains; 2) options for expander design; 3) options for improving operation with host interconnects; 4) extensions to domain validation; 5) skew management schemes; 6) improvements for physical layer signal integrity; 7) power management; 8) voltage reduction options; 9) other capabilities that may fit within the general application scope of the this project.
- d.
- e. Publications During Past Year: none.
- f. Statement of Progress or Accomplishments During Year: Development phase just started.

- g. Statement of Status as of This Report: In development.
- h. Future Plans: It seems likely that a SPI-5 will be proposed.
- i. Reasons for Delay: none.

42. **SCSI Domain Validation Technical Report (SDV)**

- a. Project ____-D, SCSI Domain Validation Technical Report (SDV)
- b. Target date for dpANS to NCITS:
 - Original target date: November 2001
 - Previous target date:
 - Current target date: November 2001
- c. Project Description: The SCSI Domain Validation (SDV), is an application of testing techniques to validate the communication capability of the SCSI physical layer. Some of the techniques require cooperation between host and target devices. The following items should be considered for inclusion in SDV: 1) definition of domain validation levels; 2) interoperability parameters for techniques; 3) communication methods for expanders; 4) other capabilities that may fit within the general application scope of the this project.
- d. Publications During Past Year: none.
- e. Statement of Progress or Accomplishments During Year: none.
- f. Statement of Status as of This Report: Proposed project.
- g. Future Plans: none.
- h. Reasons for Delay: none.

III. **Committee Activities**

- a. Previous Year's Meetings:
 - September 17, 1998; St. Petersburg Beach, FL
 - November 5, 1998; Palm Springs, CA
 - March 11, 1999; Harrisburg, PA
 - May 6, 1999; Manchester, NH
 - July 15, 1999; Colorado Springs, CO
 - September 16, 1999; Huntington Beach, CA
- b. Current Year's Planned Meetings T10:
 - November 4, 1999; Monterey, CA
 - January 13, 2000; Brisbane, Australia
 - March 9, 2000; Dallas, TX
 - May 18, 2000; Nashua, NH
 - July 13, 2000; Colorado Springs, CO
 - September 14, 2000, Huntington Beach, CA
 - November 2, 2000, Monterey, CA

- c. Officers: T10
Chair: John B. Lohmeyer
Vicechair: George O. Penokie
Secretary: Ralph O. Weber
- d. Membership: The current T10 membership list is attached.
- e. Liaison Activities: T11, T13, ISO/IEC JTC1/SC25/WG4, IEEE P1394.1, IEEE P1285.
- f. Administrative Matters of Note: none.
- g. Procedural Matters of Note: none.
- h. Recommendations: none.

IV. Anticipated Projects

It is anticipated that one or more projects will be needed for next-generation versions of current T10 projects as these projects near completion.

V. Future Trends in this Technical Area

The physical layer of parallel SCSI continues to take advantage of advances in silicon technology boosting transfer rates and connectivity. SCSI expanders and switches have recently emerged as methods to enhance SCSI connectivity. The trend to smaller connectors to accommodate wider data paths and smaller devices also impacts the physical layer.

The protocol layers for SCSI command sets continue to expand to encompass new physical layers being developed in other organizations. In addition, advances in parallel protocol are expected to occur in order to reduce overhead.

The SCSI command sets are evolving to encompass the latest developments in storage (e.g., digital video disks, CD recordable devices, and array controllers) as well as refinements to deal with current issues (e.g., power management and security).

Attachment 1: Committee Projects: SD-4 Data

The NCITS Secretariat provided the following data:

T10/SC25/WG4	Lower Level Interface
(Revised 08/19/99)NCITS Project:	52 - M

Standard Designation: A/I 9315:1989 [1994] **Title:** Interfaces between flexible disk cartridges drives and their host controllers

Related International Development

ISO/IEC Doc.: IS 9315:1989 JTC 1 Project: 25.13.10.01

-NCITS Project: 53 - M	
Standard Designation: X3.91M:1987 [R1997] Title:	Storage Module Interfaces (SMD-E)

Related International Development

ISO/IEC Doc.: IS 9324 JTC 1 Project: 25.13.10.03

NCITS Project: 375 - M	
Standard Designation: X3.131:1994 [] Title:	Small Computer System Interface - 2 (SCSI-2)

Related International Development

ISO/IEC Doc.: IS 9316-1:1995 JTC 1 Project: 25.13.10.13

Standard Designation: X3.131:1994/TIB-1:1995 [] **Title:** ANSI X3.131:1994
 Technical Information Bulletin 1

Related International Development

ISO/IEC Doc.: N/A JTC 1 Project: _

Standard Designation: X3.131:1994/TIB-2:1995 [] **Title:** ANSI X3.131:1994
 Technical Information Bulletin 2

Related International Development

ISO/IEC Doc.: N/A JTC 1 Project: __

-NCITS Project: 792 - M
 Standard Designation: X3.232:1996 [] **Title:** SCSI-2 Common Access Method
 Transport and SCSI Interface Module

Related International Development

ISO/IEC Doc.: DIS 15842 JTC 1 Project: 25.13.11.02

NCITS Project: 855 - D
 Standard Designation: X3.253:1995/AM1:1998 [] **Title:** Amendment 1 to ANSI
 X3.253:1995, SCSI-3 Parallel Interface (SPI)

Related International Development

ISO/IEC Doc.: JTC 1 Project:

Standard Designation: X3.253:1995 [] **Title:** SCSI-3 Parallel Interface (SPI)

Related International Development

ISO/IEC Doc.: JTC1 N 3913 JTC 1 Project: 25.13.11.05

-NCITS Project: 856 - D
 Standard Designation: X3.292:1997 [] **Title:** SCSI-3 Interlocked Protocol
 (SIP)

Related International Development

ISO/IEC Doc.: CD 14766-211 JTC 1 Project: 25.13.11.04

NCITS Project: 989 - D
 Standard Designation: X3.295:1996 [] **Title:** Serial Storage Architecture -
 Transport Layer (SSA-TP1)

Related International Development

ISO/IEC Doc.: N/A JTC 1 Project: N/A

-NCITS Project: 990 - D

Standard Designation: : [] **Title:** Common Access Method-3 (CAM-3)

Related International Development

ISO/IEC Doc.: N/A JTC 1 Project: N/A

-NCITS Project: 991 - DT
 Standard Designation: X3/TR-16:1997 [] **Title:** Technical Report for Generic
 Packetized Protocol (GPP)

Related International Development

ISO/IEC Doc.: N/A JTC 1 Project: 25.13.11.06

NCITS Project: 993 - M

Standard Designation: X3.269:1996 [] **Title:** SCSI-3 Fibre Channel Protocol (FCP)

Related International Development

ISO/IEC Doc.: JTC1 N 3917 JTC 1 Project: 25.13.13.02

-NCITS Project: 994 - M

Standard Designation: X3.270:1996 [] **Title:** SCSI-3 Architecture Model (SAM)

Related International Development

ISO/IEC Doc.: JTC1 N 3929 JTC 1 Project: N/A

-NCITS Project: 995 - D

Standard Designation: X3.301:1997 [] **Title:** SCSI-3 Primary Commands (SPC)

Related International Development

ISO/IEC Doc.: N/A JTC 1 Project: N/A

NCITS Project: 996 - D

Standard Designation: NCITS 306:1998 [] **Title:** SCSI-3 Block Commands (SBC)

Related International Development

ISO/IEC Doc.: CD 14766-321 JTC 1 Project: N/A

-NCITS Project: 997 - D

Standard Designation: : [] **Title:** SCSI-3 Stream Commands (SSC)

Related International Development

ISO/IEC Doc.: N/A JTC 1 Project: N/A

-NCITS Project: 999 - D

Standard Designation: NCITS 314:1998 [] **Title:** SCSI-3 Medium Changer Commands (SMC)

Related International Development

ISO/IEC Doc.: CD 14776-351 JTC 1 Project: N/A

NCITS Project: 1047 - D

Standard Designation: X3.276:1997 [] **Title:** SCSI-3 Controller Commands (SCC)

Related International Development

ISO/IEC Doc.: JTC1 N 3916 JTC 1 Project: N/A

-NCITS Project: 1048 - D

Standard Designation: X3.304:1997 [] **Title:** SCSI-3 Multimedia Commands (MMC)

Related International Development

ISO/IEC Doc.: CD 14766-361 JTC 1 Project: N/A

-NCITS Project: 1051 - D

Standard Designation: NCITS 309:1997 [] **Title:** Serial Storage Architecture - SCSI-3 Protocol (SSA-S3P)

Related International Development

ISO/IEC Doc.: N/A JTC 1 Project: N/A

NCITS Project: 1071 - M
 Standard Designation: X3.277:1996 [] **Title:** SCSI-3 Fast-20 Parallel Interface (Fast-20)
Related International Development

ISO/IEC Doc.: JTC1 N 3915 JTC 1 Project: N/A

-NCITS Project: 1121 - D
 Standard Designation: X3.294:1996 [] **Title:** Serial Storage Architecture - SCSI-2 Protocol (SSA-S2P)
Related International Development

ISO/IEC Doc.: N/A JTC 1 Project: N/A

-NCITS Project: 1142 - D
 Standard Designation: X3.302:1998 [] **Title:** SCSI-3 Parallel Interface - 2 (SPI-2)
Related International Development

ISO/IEC Doc.: CD 14776-112 JTC 1 Project:

NCITS Project: 1143 - TR
 Standard Designation: NCITS/TR-23:1998 [] **Title:** Technical Report for SCSI Enhanced Parallel Interface (EPI)
Related International Development

ISO/IEC Doc.: JTC 1 Project:

-NCITS Project: 1144 - D
 Standard Designation: : [] **Title:** SCSI Fibre Channel Protocol - 2 (FCP-2)
Related International Development

ISO/IEC Doc.: JTC 1 Project:

-NCITS Project: 1145 - D
 Standard Designation: X3.293:1996 [] **Title:** Serial Storage Architecture - Physical Layer 1 (SSA-PH1)
Related International Development

ISO/IEC Doc.: JTC 1 Project:

NCITS Project: 1146 - D
 Standard Designation: NCITS 307:1997 [] **Title:** Serial Storage Architecture - Physical Layer 2 (SSA-PH2)
Related International Development

ISO/IEC Doc.: JTC 1 Project:

-NCITS Project: 1147 - D
 Standard Designation: NCITS 308:1997 [] **Title:** Serial Storage Architecture - Transport Layer 2 (SSA-TL2)
Related International Development

ISO/IEC Doc.: JTC 1 Project:

-NCITS Project: 1155 - D
 Standard Designation: NCITS 325:1998 [] **Title:** SCSI-3 Serial Bus Protocol 2 (SBP-2)

Related International Development

ISO/IEC Doc.: JTC 1 Project:

NCITS Project: 1157 - DStandard Designation: : [] **Title:** SCSI Architecture Model-2 (SAM-2)**Related International Development**

ISO/IEC Doc.: JTC 1 Project:

-NCITS Project: 1212 - DStandard Designation: NCITS 305:1998 [] **Title:** SCSI Enclosure Services (SES)**Related International Development**

ISO/IEC Doc.: CD 14776-371 JTC 1 Project:

-NCITS Project: 1225 - DStandard Designation: NCITS 318:1998 [] **Title:** SCSI Controller Commands - 2 (SCC-2)**Related International Development**

ISO/IEC Doc.: CD 14776-342 JTC 1 Project:

NCITS Project: 1228 - DStandard Designation: NCITS 333: [] **Title:** SCSI Multi-Media Commands - 2 (MMC-2)**Related International Development**

ISO/IEC Doc.: JTC 1 Project:

-NCITS Project: 1236 - DStandard Designation: : [] **Title:** SCSI Primary Commands - 2 (SPC-2)**Related International Development**

ISO/IEC Doc.: CD 14766-311 JTC 1 Project:

-NCITS Project: 1240 - DStandard Designation: NCITS 330: [] **Title:** Reduced Block Commands (RBC)**Related International Development**

ISO/IEC Doc.: JTC 1 Project:

NCITS Project: 1302 - DStandard Designation: : [] **Title:** SCSI Parallel Interface-3 (SPI-3)**Related International Development**

ISO/IEC Doc.: JTC 1 Project:

-NCITS Project: 1303 - DTStandard Designation: : [] **Title:** SCSI Enclosure Profile**Related International Development**

ISO/IEC Doc.: JTC 1 Project:

-NCITS Project: 1363 - DStandard Designation: : [] **Title:** MultiMedia Command Set-3 (MMC-3)**Related International Development**

ISO/IEC Doc.: JTC 1 Project:

NCITS Project: 1364 - D

Standard Designation: : [] **Title:** Reduced MultiMedia Command Set (RMC)

Related International Development

ISO/IEC Doc.: JTC 1 Project:

-NCITS Project: 1365 - D

Standard Designation: : [] **Title:** SCSI Parallel Interface-4 (SPI-4)

Related International Development

ISO/IEC Doc.: JTC 1 Project:

Attachment 2: Internal Procedures

The T10 internal procedures are as follows:

T10 Standards Development Policies and Procedures:	ftp://ftp.t10.org/t10/document.94/94-198r3.pdf
T10 Electronic Procedures:	ftp://ftp.t10.org/t10/document.95/95-146r2.pdf
T10 Procedure for Funding Technical Editors:	ftp://ftp.t10.org/t10/document.95/95-148r0.pdf
T10 Document Retention Policy:	ftp://ftp.t10.org/t10/document.98/98-107r1.pdf

The above procedures have been approved by PPC. T10 is in the process of revising the T10 Electronic Procedures to reflect the new T10 FTP and web site ([ftp.t10.org](ftp://ftp.t10.org) and www.t10.org). The revised procedure will likely be forwarded for approval in November 1999.

Attachment 3: T10 Current Membership List

This file contains the T10 attendance database in ASCII format. It is not the "official" T10 membership list that is maintained by the NCITS Secretariat. The NCITS list includes people who have never attended a T10 meeting, but have paid their fee(s) and are in "good standing". This list is used for keeping track of attendance since there are minimum attendance requirements to maintain voting rights.

The code in parentheses following people's names indicates their membership status:

- P - the Principal member for an organization
- A - the first Alternate member for an organization
- A# - an additional Alternate member for an organization
- O - an Observer member of T10
- L - a Liaison member of T10 (usually a member of another standards group)
- XO - Ex Officio member of T10 (several NCITS officers are Ex Officio members of T10)

(This report was generated 1999/09/14 at 09:56:59.)

Mr. Lawrence J. Lamers (P)
Adaptec, Inc.
691 S. Milpitas Blvd.
Milpitas, CA 95035
Phone: (408) 957-7817
Fax: (408) 957-7193
Email: ljlammers@ieee.org

Mr. Vincent Bastiani (A#)
Adaptec, Inc.
691 S. Milpitas Blvd.
Milpitas, CA 95035
Phone: (408) 957-7153
Fax:
Email: bastiani@corp.adaptec.com

Mr. Wally Bridgewater (A#)
Adaptec, Inc.
691 S. Milpitas Blvd.
Milpitas, CA 95035
Phone: (408) 945-8600
Fax:
Email: wally@eng.adaptec.com

Mr. Mark Delsman (A)
Adaptec, Inc.
691 S. Milpitas Blvd.
Milpitas, CA 95035
Phone: (408) 957-5661
Fax:
Email: mdelsman@corp.adaptec.com

Mr. Robert Frey (P)

Advansys
1150 Ringwood Ct.
San Jose, CA 95131
Phone: (408) 383-5915
Fax: (408) 383-9612
Email: bobf@advansys.com

Mr. Steven P. Ego (O)
Aeronics Inc.
12741 Research Blvd #500
Austin, TX 78759
Phone: (512) 258-2303
Fax: (512) 258-4392
Email:

Mr. Kent Manabe (O)
America Kotobuki Electronics
100 Century Center Ct. #310
San Jose, CA 95112
Phone: (408) 441-9232
Fax: (408) 441-9246
Email: manabe@ix.netcom.com

Mr. Scott Lindstrom (P)
AMP, Inc.
603 Groves Street
Lowell, NC 28098
Phone: (704) 824-6352
Fax: (704) 824-6268
Email: slindstr@amp.com

Mr. Elwood Parsons (A)
AMP, Inc.
P.O. Box 3608 M/S 290-015
Harrisburg, PA 17105-3608
Phone: (717) 810-4660
Fax: (717) 810-4655
Email: etparson@amp.com

Mr. Hank Herrmann (O)
AMP, Inc.
MS 106-14, P.O. Box 3608
Harrisburg, PA 17105-3608
Phone: (717) 986-5534
Fax: (717) 986-5643
Email: Hank.Herrmann@amp.com

Ms. Bonnie Rose (O)
Amphenol Canada Corp.
20 Melford Dr.
Scarborough, Ontario
Canada M1B 2X6
Phone: (416) 291-4401 x2239
Fax: (416) 292-0647
Email: brose@cosmosgroup.com

Mr. Bill Mable (P)
Amphenol Interconnect
20 Valley St.
Endicott, NY 13760
Phone: (607) 786-4236
Fax: (607) 786-4311
Email: bmable@spectra.net

Mr. Michael Wingard (A)
Amphenol Interconnect
20 Valley St.
Endicott, NY 13760
Phone: (607) 786-4241
Fax: (607) 786-4311
Email: mikwingard@aol.com

Mr. Bart Raudebaugh (P)
Ancot Corp.
115 Constitution Dr.
Menlo Park, CA 94025
Phone: (415) 322-5322
Fax: (415) 322-0455
Email: bart@ancot.com

Mr. Gregg Neely (P)
Andataco
10140 Mesa Rim Rd.
San Diego, CA 92121
Phone: (619) 453-9696
Fax: (619) 453-9294
Email: greggn@andataco.com

Mr. Harlan Andrews (P)
Apple Computer
6 Infinite Loop MS 306-2MS
Cupertino, CA. 95014
Phone: (408) 974-6430
Fax: (408) 862-7577
Email: hea@apple.com

Mr. Ron Roberts (A)
Apple Computer
3535 Monroe St. MS:69-G
Santa Clara, CA 95051
Phone: (530) 677-5714
Fax: (530) 677-1218
Email: rkroberts@aol.com

Mr. James R. Bergsten (O)
Ark Research Corp.
1190 Saratoga Ave. #110
San Jose, CA 95129-3433
Phone: (408) 260-5900
Fax: (408) 260-5908
Email: bergsten@arkres.com

Mr. Douglas Wagner (P)
Berg Electronics
472 Delwood Ct.
Newbury Park, CA 91320-4819
Phone: (805) 498-0325
Fax: (805) 498-0325
Email: wagnerdl@bergelect.com

Mr. Jim Koser (A)
Berg Electronics
825 Old Trail Road
Etters, PA 17319
Phone: (717) 938-7679
Fax: (717) 938-7991
Email:

Mr. Bill Galloway (P)
BREA Technologies, Inc.
14902 Mesita Dr.
Houston, TX 77083
Phone: (281) 530-3063
Fax: (281) 988-0358
Email: billg@breatech.com

Mr. Joseph Basista (O)
C&M Corp.
51 South Walnut Street
P.O. Box 348
Wauregan, CT 06387
Phone: (607) 687-1044
Fax: (607) 687-7534
Email:

Mr. Gerry Johnsen (O)
Ciprico Inc.
2800 Campus Dr. Suite 60
Plymouth, MN 55441
Phone: (612) 551-4000
Fax: (612) 551-4002
Email: gerry@ciprico.com

Mr. Ian Morrell (P)
Circuit Assembly Corp.
18 Thomas St.
Irvine, CA 92718-2703
Phone: (949) 598-1780
Fax: (949) 855-4298
Email: ianm@circuitassembly.com

Mr. Dennis Lang (A)
Circuit Assembly Corp.
18 Thomas St.
Irvine, CA 92718-2703
Phone: (949) 855-7887
Fax: (949) 855-4298
Email: dennisl@circuitassembly.com

Mr. Ben Chang (O)
Cirrus Logic Inc.
3100 W. Warren Ave.
Fremont, Ca 94538
Phone: (510) 226-2394
Fax:
Email: ben@corp.cirrus.com

Mr. Edward Haske (P)
CMD Technology
1 Vanderbilt
Irvine, CA 92718
Phone: (714) 454-0800
Fax: (714) 455-1656
Email: haske@cmd.com

Mr. Robert C. Elliott (P)
Compaq Computer Corp.
MS 120810
PO Box 692000
Houston, TX 77269-2000
Phone: (281) 518-5037
Fax: (281) 518-7135
Email: Robert.Elliott@compaq.com

Mr. William Dallas (A#)
Compaq Computer Corp.
ZK03-3/T79
110 Spit Brook Road
Nashua, NH 03062-2698
Phone: (603) 884-2508
Fax: (603) 884-2257
Email: dallas@zk3.dec.com

Mr. Douglas Hagerman (A#)
Compaq Computer Corp.
SHR3-2/W3
334 South Street
Shrewsbury, MA 01545
Phone: (508) 841-2145
Fax: (508) 841-6100
Email: douglas.hagerman@compaq.com

Dr. William Ham (A)
Compaq Computer Corp.
SHR3-2/W04
334 South Street
Shrewsbury, MA 01545
Phone: (508) 841-2629
Fax: (508) 841-5266
Email: bill.ham@digital.com

Mr. Mike Zandy (A#)
Compaq Computer Corp.
MS 640222

PO Box 692000
Houston, TX 77269-2000
Phone: (281) 518-7930
Fax:
Email: Mike.Zandy@compaq.com

Mr. Peter Johansson (O)
Congruent Software, Inc.
3998 Whittle Ave.
Oakland, CA 94602
Phone: (510) 527-3926
Fax: (510) 531-2942
Email: pjohansson@aol.com

Mr. Neil Wanamaker (P)
Crossroads Systems, Inc.
9390 Research Blvd.
Suite II-300
Austin, TX 78759
Phone: (512) 794-2727
Fax: (512) 349-0304
Email: ntw@crossroads.com

Mr. Stephen K. Wilson (A)
Crossroads Systems, Inc.
9390 Research Blvd.
Suite II-300
Austin, TX 78759
Phone: (512) 794-2716
Fax:
Email: steve@crossroads.com

Mr. Charles Tashbook (P)
Dallas Semiconductor
4401 S. Beltwood Pkwy.
Dallas, TX 75244-3292
Phone: (972) 371-4110
Fax: (972) 371-3715
Email: charles.tashbook@dalsemi.com

Mr. Michael Smith (A)
Dallas Semiconductor
4401 S. Beltwood Pkwy
Dallas, TX 75244
Phone: (972) 371-4457
Fax: (214) 450-3715
Email: mike.smith@dalsemi.com

Mr. Bill Anderson (O)
DDK Electronics
3001 Oakmead Village Dr.
Santa Clara, CA 95051
Phone: (408) 980-8344
Fax: (408) 980-9750
Email: bill_anderson@ddkconnectors.com

Mr. Ricardo Dominguez (O)
Dell Computer
One Dell Way
Round Rock, TX 78682
Phone: (512) 728-8996
Fax: (512) 728-3653
Email: ricardo_dominguez@dell.com

Mr. James Benfer (O)
Digi-Data Corp.
8580 Dorsey Run Road
Jessup, MD 20794
Phone: (301) 498-0200
Fax:
Email:

Mr. Roger Cummings (P)
Distributed Processing Tech.
140 Candace Dr.
Maitland, FL 32751
Phone: (407) 830-5522 x348
Fax: (407) 260-5366
Email: cummings_roger@dpt.com

Mr. Mike Gerwig (A)
Distributed Processing Tech.
140 Candace Dr.
Maitland, FL 32751
Phone: (407) 830-5522 x380
Fax: (407) 260-5366
Email: gerwig@dpt.com

Mr. Ed Kavetsky (A#)
Distributed Processing Tech.
140 Candace Dr.
Maitland, FL 32751
Phone: (407) 830-5522 x344
Fax: (407) 260-5366
Email: kavetsky@dpt.com

Mr. Robert Reisch (O)
Eastman Kodak Co.
460 Buffalo Road
Rochester, NY 14652-3816
Phone: (716) 588-0573
Fax: (716) 588-2624
Email: reisch@kodak.com

Mr. Terry Maezawa (O)
Electronic&Ind. Enterprises
Suite 216
21 Eastbrook Bend
Peachtree City, GA 30269
Phone: (404) 487-5815
Fax:
Email:

Mr. I. Dal Allan (P)
ENDL
14426 Black Walnut Ct.
Saratoga, CA 95070
Phone: (408) 867-6630
Fax: (408) 867-2115
Email: endlcom@ibm.net

Mr. Tom Jackson (P)
Exabyte Corp.
1685 38th Street
Boulder, CO 80301
Phone: (303) 417-7201
Fax: (303) 417-7829
Email: thomasj@exabyte.com

Mr. Frank Wang (A)
Exabyte Corp.
1685 38th Street
Boulder, CO 80301
Phone: (303) 417-7672
Fax: (303) 417-7829
Email: frankw@exabyte.com

Mr. Stephen Jarvis (O)
Foxconn
6125 Phyllis Drive
Cypress, CA 90630
Phone: (714) 890-8628 x230
Fax: (714) 892-8668
Email:

Mr. Don Soracco (O)
Foxconn I/O
60 Pond St.
Dunstable, MA 01827
Phone: (978) 649-9997
Fax: (978) 649-9797
Email:

Mr. Gary R. Stephens (A)
FSI Consulting Services
1825 N. Norton
Tucson, AZ 85719
Phone: (520) 321-1725
Fax: (520) 321-1725
Email: grsfsi@aol.com

Mr. Eugene Lew (A)
Fujitsu
2904 Orchard Pkwy
San Jose, CA 95134
Phone: (408) 894-3874
Fax:
Email: elew@fcpa.fujitsu.com

Mr. Ben-Koon Lin (P)
Fujitsu (FCPA)
2904 Orchard Pkwy.
San Jose, CA 95134
Phone: (408) 894-3979
Fax: (408) 894-3908
Email: blin@fcpa.fujitsu.com

Mr. Kazuo Nakashima (O)
Fujitsu Computer Products, Am
2904 Orchard Parkway
San Jose, CA 95134
Phone: (408) 894-3849
Fax: (408) 894-3907
Email: knakashima@fcpa.fujitsu.com

Mr. Bob Thornton (O)
Fujitsu Takamisawa America
250 E. Caribbean Dr.
Sunnyvale, CA 94089
Phone: (408) 745-4932
Fax: (408) 745-4971
Email: bthornto@fta.fujitsu.com

Mr. Nathan Hastad (P)
General Dynamics
8800 Queen Ave. S.
Bloomington, MN 55431
Phone: (612) 921-6635
Fax: (612) 921-6345
Email: nathan.j.hastad@gd-is.com

Mr. Tim Mackley (A)
General Dynamics
8800 Queen Ave. S.
Bloomington, MN 55431
Phone: (612) 921-6866
Fax:
Email: timothy.a.mackley@gd-is.com

Mr. Pak Chan (O)
Gigalabs Inc.
290 Santa Ana Court
Sunnyvale, CA 94086
Phone: (408) 481-3030
Fax: (408) 481-3045
Email: pchan@giglabs.com

Ms. Liza Hunt (XO)
Global Engineering Documents
15 Inverness Way East
Englewood, CO 80112-5704
Phone:
Fax:
Email:

Mr. Rodger Burke (P)
Harting, Inc. of N. America
1370 Bowes Road
Elgin, IL 60123
Phone: (847) 741-1500 x286
Fax: (847) 741-8257
Email: Rodger.Burke@harting.com

Mr. J. R. Sims (P)
Hewlett Packard Co.
800 S. Taft Ave.
Loveland, CO 80537
Phone: (970) 635-6774
Fax: (970) 635-6610
Email: robsims@hootie.lvld.hp.com

Mr. Matt Wakeley (A)
Hewlett Packard Co.
8000 Foothills Blvd.
Roseville, CA 95747
Phone: (916) 785-4259
Fax: (916) 785-1997
Email: matt_wakeley@hp.com

Mr. Donald C. Loughry (XO)
Hewlett Packard Co.
M/S 43UC NCITS Vice Chair
19420 Homestead Rd.
Cupertino, CA 95014
Phone: (408) 447-2454
Fax: (408) 447-2247
Email: don_loughry@hp6600.desk.hp.com

Mr. Brad Culp (O)
Hewlett Packard Co.
700 71st. Ave.
Greeley, CO 80631
Phone: (970) 350-4592
Fax: (970) 352-3524
Email: brad-culp@hp.com

Mr. Steve Krupa (O)
Hewlett Packard Co.
Filton Road
Stoke Gifford
Bristol BS12 6QZ England
Phone:
Fax:
Email:

Ms. Jacqueline Sylvia (A)
Hitachi Cable Manchester
900 Holt Ave.
Manchester, NH 03109
Phone: (603) 669-4347

Fax:

Email: jsylvia@hcm.hitachi.com

Mr. Zane Daggett (P)
Hitachi Cable Manchester, Inc
900 Holt Ave.
Manchester, NH 03109
Phone: (603) 669-4347 x236
Fax: (603) 669-9621
Email: zdaggett@hcm.hitachi.com

Mr. Paul Boulay (O)
Hitachi Computer Systems Div
3101 Tasman Drive
Santa Clara, CA 95054
Phone: (408) 986-9770 x205
Fax: (408) 986-1821
Email: p_boulay@hitachi.com

Mr. Hitoshi Ogawa (O)
Hitachi Ltd.
Systems Development Lab
292 Yoshida-Cho
Yokohama-Shi 244 Japan
Phone: 1181-45881-1241
Fax: 1181-45860-1674
Email: hogawa@yokolab.sdl.hitachi.co.jp

Mr. Anthony Yang (P)
Hitachi Storage Products
1971 Milmont Drive
Milpitas, CA 95035
Phone: (408) 941-7048
Fax: (408) 946-1062
Email: anthony.yang@hal.hitachi.com

Mr. Quang Vuong (A)
Hitachi Storage Products
3101 Tasman Drive M/S 75
Santa Clara, CA 95054
Phone: (408) 748-2806
Fax: (408) 235-8942
Email: vuong_q@hal.sp.hitachi.com

Mr. Thomas J. Kulesza (P)
Honda Connectors
960 Corporate Woods Parkway
Vernon Hill, IL 60061
Phone: (847) 913-9566
Fax: (847) 913-9587
Email: tkulesza@hondaconnectors.com

Mr. Terry Enright (A)
Honda Connectors
960 Corporate Woods Parkway
Vernon Hill, IL 60061

Phone: (847) 913-9566
Fax: (847) 913-9587
Email:

Mr. George O. Penokie (P)
IBM Corp.
2B7/114-2
37st Highway 52 N.
Rochester, MN 55901-7829
Phone: (507) 253-5208
Fax: (507) 253-2880
Email: gop@us.ibm.com

Mr. Dan Colegrove (A#)
IBM Corp.
LJ4/012
5600 Cottle Rd.
San Jose, CA 95193
Phone: (408) 256-1978
Fax: (408) 256-1044
Email: colegrov@us.ibm.com

Mr. John P. Scheible (A)
IBM Corp.
Bldg 815 MS 4051
11400 Burnett Rd.
Austin, TX 78758
Phone: (512) 823-8208
Fax: (512) 823-0758
Email: Scheible@vnet.ibm.com

Mr. Robert Basham (O)
IBM Corp.
65U/031-Z
9000 S. Rita Rd.
Tucson, AZ 85744
Phone: (520) 799-4923
Fax:
Email: robbyb@us.ibm.com

Mr. Tim Bradshaw (P)
Iomega Corp.
1821 Iomega Way
Roy, UT 84067
Phone: (801) 778-4262
Fax: (801) 778-4170
Email: bradshat@iomega.com

Mr. Darrell Redford (A)
Iomega Corp.
1821 West Iomega Way
Roy, UT 84067
Phone: (801) 778-4432
Fax: (801) 778-4170
Email: redfordd@iomega.com

Mr. David L. Jolley (A#)
Iomega Corporation
1821 West Iomega Way
Roy, UT 84067
Phone: (801) 778-3641
Fax: (801) 778-5261
Email: jolley@iomega.com

Mr. Dennis Moore (P)
KnowledgeTek, Inc.
7230 West 119th Pl, Suite C
Broomfield, CO 80020
Phone: (303) 465-1800
Fax: (303) 426-1350
Email: dmoore@ix.netcom.com

Mr. Hayden Smith (P)
Lasercard Systems Corp.
2644 Bayshore Parkway
Mountain View, CA 94043
Phone: (650) 969-4428
Fax: (650) 967-6524
Email: hsmith@lasercard.com

Mr. Louis Grantham (P)
Linfinity Micro
101 W. McDermott
Allen, TX 75013
Phone: (972) 396-7002
Fax: (972) 396-7533
Email: lgrantham@linfinity.com

Mr. John Lohmeyer (P)
LSI Logic Corp.
4420 ArrowsWest Dr.
Colorado Springs, CO 80907
Phone: (719) 533-7560
Fax: (719) 533-7183
Email: lohmeier@t10.org

Mr. Ralph O. Weber (A)
LSI Logic Corp.
Suite 400
12377 Merit Drive
Dallas, TX 75251
Phone: (972) 503-3205 x228
Fax: (972) 503-2258
Email: roweber@acm.org

Ms. Jie Fan (P)
Madison Cable Corp.
125 Goddard Memorial Dr.
Worcester, MA 01603
Phone: (508) 752-2884 x306
Fax: (508) 752-4230
Email: jfan@madisoncable.com

Mr. Chuck Grant (A)
Madison Cable Corp.
125 Goddard Memorial Drive
Worcester, MA 01603
Phone: (508) 752-2884 x725
Fax: (508) 752-4230
Email: cgrant@madisoncable.com

Mr. Takaharu Ai (O)
Matsushita Elec. Indust. Co.
4-16-12
Matsuo-cho
Kadoma, Osaka 571-8504 Japan
Phone: +81-6-906-2330
Fax: +81-6-906-1549
Email: aiai@dspd.mei.co.jp

Mr. Hiroshi Ueda (O)
Matsushita Electric
1006 Kadoma Kadoma-shi
Osaka, Japan
Phone: +81-6-6900 9259
Fax:
Email: hueda@isl.mei.co.jp

Mr. Pete McLean (P)
Maxtor Corp.
2190 Miller Dr.
Longmont, CO 80501
Phone: (303) 678-2149
Fax: (303) 678-2165
Email: pete_mclean@maxtor.com

Mr. Charley Riegger (A)
Maxtor Corp.
510 Cottonwood Dr.
Milpitas, CA 95035
Phone: (408) 432-4571
Fax: (408) 432-4432
Email: charles_riegger@maxtor.com

Mr. LeRoy Leach (O)
Maxtor Corp.
2190 Miller Dr.
Longmont, CO 80501-6744
Phone: (303) 678-2828
Fax: (303) 678-2308
Email: leroy_leach@maxtor.com

Mr. Randy Banton (O)
Mercury Computer
199 Riverneck Road
Chelmsford, MA 01824
Phone: (508) 256-1300 x134
Fax:

Email:

Mr. Bob Masterson (P)
Methode Electronics, Inc.
7444 West Wilson Ave
Chicago, IL 60656
Phone: (708) 867-9600
Fax: (708) 867-3149
Email: rwmast@methode.com

Mr. Frank Samela (A)
Methode Electronics, Inc.
7444 W. Wilson Ave.
Chicago, IL 60148
Phone: (708) 867-9600
Fax: (708) 867-0346
Email: franksam@methode.com

Mr. Joe Dambach (P)
Molex Inc.
2222 Wellington Court
Lisle, IL 60532
Phone: (708) 527-4546
Fax: (708) 969-1352
Email: jdambach@molex.com

Mr. Jay Neer (A)
Molex Inc.
399 W. Camino Gardens Blvd.
Suite 103
Boca Raton, FL 33432
Phone: (561) 447-2907
Fax: (561) 447-2908
Email: jneer@molex.com

Mr. Martin Ogbuokiri (O)
Molex Inc.
2222 Wellington Court
Data Comm
Lisle, IL 60532
Phone: (630) 527-4370
Fax: (630) 969-1352
Email: mogbuokiri@molex.com

Mr. Richard Wagner (O)
Montrose/CDT
28 Sword Street
Auburn, MA 01501
Phone: (508) 791-3161
Fax: (508) 798-8353
Email: rwagner@montrose-cdt.com

Mr. Brian McKean (P)
Mylex Corp.
4900 Pearl East Circle #104
Boulder, CO 80301-6108

Phone: (303) 381-4246
Fax: (303) 413-0464
Email: brianm@mylexboulder.com

Mr. Allen King (A)
Mylex Corp.
34551 Arderwood Blvd.
Fremont, CA 94555-3607
Phone: (510) 608-2251
Fax: (510) 797-4907
Email: allenk@mylex.com

Mr. Edward A. Gardner (P)
Ophidian Designs
1262 Hofstead Terrace
Colorado Springs, CO 80907
Phone: (719) 593-8866
Fax: (719) 593-8989
Email: eag@ophidian.com

Mr. Han Zou (P)
Panasonic Technologies, Inc
2 Research Way
Princeton, New Jersey 08540
Phone: (609) 734-7326
Fax: (609) 987-8827
Email: hanzou@research.panasonic.com

Dr. Terry Nelson (A)
Panasonic Technologies, Inc
2 Research Way
Princeton, NJ 08540
Phone: (609) 734-7324
Fax: (609) 987-8827
Email: tnelson@research.panasonic.com

Mr. William P. McFerrin (P)
Philips Electronics
1860 Lefthand Circle
Longmont, CO 80501
Phone: (303) 651-5408
Fax: (303) 682-3029
Email: BMcFerrin@aol.com

Mr. Randall C. Hines (A)
Philips Electronics
1860 Lefthand Circle
Longmont, CO 80501
Phone: (303) 651-5406
Fax: (303) 682-3029
Email: hinesr@worldnet.att.net

Mr. Skip Jones (P)
QLogic Corp.
3545 Harbor Blvd.
Costa Mesa, CA 92626

Phone: (714) 668-5058
Fax: (714) 688-5008
Email: sk_jones@qlc.com

Mr. Richard Moore (A#)
QLogic Corp.
3545 Harbor Blvd.
Costa Mesa, CA 92626
Phone: (714) 668-6816
Fax:
Email: r_moore@qlc.com

Mr. Dean Wallace (A)
QLogic Corp.
3545 Harbor Blvd.
Costa Mesa, CA 92675
Phone: (714) 668-5028
Fax: (714) 668-5095
Email: d_wallace@qlc.com

Mr. Mark Evans (P)
Quantum Corp.
500 McCarthy Blvd.
Milpitas, CA 95035
Phone: (408) 894-4019
Fax: (408) 894-4990
Email: mark.evans@quantum.com

Mr. Patrick McGarrah (A)
Quantum Corp.
333 South St.
Shrewsbury, MA 01545
Phone: (508) 770-6364
Fax: (508) 770-2299
Email: pat.mcgarrah@quantum.com

Mr. James McGrath (A#)
Quantum Corp.
500 McCarthy Blvd.
Milpitas, CA 95035
Phone: (408) 894-4504
Fax: (408) 894-6375
Email: JMCGRATH@QNTM.COM

Mr. John A. Fobel (O)
Rancho Technology, Inc.
10783 Bell Court
Rancho Cucamonga, CA 91730
Phone: (909) 987-3966
Fax: (909) 989-2365
Email: johnf@rancho.com

Mr. Ken-Ichi Kojima (O)
Sanyo Electric Co., Ltd.
180 Ohmori Anpachi-Cho
Anpachi-Gun

Gifu-Ken 503-01 Japan
Phone: 584-64-4399
Fax: 584-64-5096
Email:

Mr. Gene Milligan (P)
Seagate Technology
MS OKM 251
P. O. Box 12313
Oklahoma City, OK 73157
Phone: (405) 324-3070
Fax: (405) 324-3794
Email: Gene_Milligan@notes.seagate.com

Mr. Gerald Houlder (A)
Seagate Technology
MPS043
8001 E. Bloomington Freeway
Bloomington, MN 55420-1094
Phone: (612) 806-2869
Fax: (612) 806-2708
Email: Gerry_Houlder@notes.seagate.com

Mr. Daniel (Dan) F. Smith (O)
Seagate Technology
4585 Scotts Valley Dr.
Scotts Valley, CA 95066-4544
Phone: (408) 439-7146
Fax: (408) 438-4846
Email: daniel_f_smith@notes.seagate.com

Mr. Yasunori Hiyoshi (O)
Seiko Epson Corp.
Corporate Res & Dev
3-3-5 Owa Suma-Shi
Nagano-Ken 392-8502 Japan
Phone:
Fax:
Email: yasunori.hiyoshi@exc.epson.co.jp

Mr. Erhard Weiss (O)
Siemens Nixdorf
Department: SNI PC SB ESW
Burgermeister-Ulrich-St
D-86199 Augsburg Germany
Phone: 49-821-804-3602
Fax: 49-821-804-2910
Email: weiss.abg@sni.de

Mr. Robert Morris (P)
Silicon Systems, Inc.
14351 Myford Rd.
Tustin, CA 92780
Phone: (714) 573-6616
Fax:
Email: bob.morris@ti.com

Mr. Stephen G. Finch (A)
Silicon Systems, Inc.
14351 Myford Road
Tustin, CA 92780-7022
Phone: (714) 573-6808
Fax: (714) 573-6916
Email: steve.finch@tus.ssil.com

Mr. James Ryland (L)
Social Security Admin
NCC Room 5110 OMC liaison
6201 Security Blvd.
Baltimore, MD 21234-0001
Phone: (410) 965-2166
Fax: (410) 966-1893
Email: JRYLAND@SSA.SSW.DHHS.GOV

Mr. Greg Alvey (O)
Solution Technology
P.O. Box 104
Boulder Creek, CA 95006
Phone: (408) 338-4285
Fax: (408) 338-4374
Email: kd6hnm@aol.com

Mr. Dennis Pak (O)
Sony Electronics, Inc.
3300 Zanker Rd. MS# SJ-3B2
San Jose, CA 95134
Phone: (408) 955-5247
Fax: (408) 955-5066
Email: dennis_pak@asd.sel.sony.com

Mr. Jeffrey Schroeder (O)
ST Microelectronics
1060 E. Brokaw Rd.
San Jose, CA 95131
Phone: (408) 487-3965
Fax: (408) 441-8470
Email: jeffrey.schroeder@st.com

Mr. Rich Wahler (O)
Standard Microsystems Corp.
300 Kennedy Drive
Hauppauge, NY 11788
Phone: (516) 435-6174
Fax: (516) 724-1505
Email:

Mr. Erich Oetting (P)
Storage Technology Corp.
2270 South 88th St.
Louisville, CO 80028-0268
Phone: (303) 673-2178
Fax: (303) 673-8196

Email: erich_oetting@stortek.com

Mr. Doug Charnley (A)
Storage Technology Corp.
2270 South 88th St. MS 0211
Louisville, CO 80028-0211
Phone: (303) 661-7271
Fax: (303) 673-8196
Email: doug_chnarnley@stortek.com

Mr. David Peterson (O)
StorageTek Network Sys. Grp
7600 Brooklyn Blvd.
Brooklyn Park, MN 55428
Phone: (612) 391-1008
Fax: (612) 391-1095
Email: dap@network.com

Mr. Robert N. Snively (P)
Sun Microsystems Computer Co
Mail Stop NWK04-104
901 San Antonio Road
Palo Alto, CA 94303-4900
Phone: (510) 574-9051
Fax: (510) 574-9504
Email: bob.snively@sun.com

Mr. Franklin Ng (A)
Sun Microsystems Computer Co
MS NWK02-101
901 San Antonio Rd.
Palo Alto, CA 94303
Phone: (510) 574-9195
Fax: (510) 574-9501
Email: franklin.ng@ebay.sun.com

Mr. Vit Novak (A)
Sun Microsystems, Inc.
Mail Stop 15-46
2550 Garcia Ave.
Mountain View, CA 94043-1100
Phone: (650) 688-9033
Fax: (650) 688-9265
Email: vit.novak@sun.com

Mr. Pete Tobias (A#)
Tandem, a Compaq Company
Loc 100-03
10555 Ridgeview Ct.
Cupertino, CA 95014-0789
Phone: (408) 285-9913
Fax: (408) 285-9924
Email: tobias_pete@tandem.com

Mr. Ken Plourde (O)
Temp Flex Cable, Inc.

11 Depot St.
S. Grafton, MA 01560
Phone: (508) 839-5987
Fax: (508) 839-4128
Email: kplourde@templex.com

Ms. Dora M. Deivert (O)
The JPM Company
2135 Ringwood Ave.
San Jose, CA 95131
Phone: (408) 952-3510
Fax: (408) 435-9775
Email: dmdeivert@jpmsj.com

Mr. Bill Youngman (O)
The JPM Company
2135 Ringwood Ave.
San Jose, CA 95131
Phone: (408) 952-3503
Fax: (408) 435-1109
Email: byoungman@jpmsj.com

Mr. Davin Stockwell (O)
Thomas & Betts Corp.
Electronics Division
Irvine, CA 92618
Phone: (714) 951-6621 x3433
Fax: (714) 951-1016
Email: dstockwell@thombetts.com

Mr. Tasuku Kasebayashi (P)
Toshiba America Elec. Comp.
35 Hammond
Irvine, CA 92618-1607
Phone: (949) 461-3886
Fax: (949) 458-7815
Email: task.kasebayashi@taec.toshiba.com

Mr. Kenneth J. Hallam (P)
UNISYS Corporation
MV201
25725 Jeronimo Road
Mission Viejo, CA 92691
Phone: (949) 380-5115
Fax: (949) 380-5858
Email: ken.hallam@unisys.com

Mr. Arlan P. Stone (A)
UNISYS Corporation
MS 201
25725 Jeronemo Rd.
Mission Viejo, CA 92691
Phone: (949) 380-5982
Fax: (949) 380-5858
Email: arlan.stone@unisys.com

Mr. Dave Wehrman (O)
UNISYS Corporation
11716 Highridge
Pinckney, MI 48169
Phone: (313) 426-8847
Fax: (313) 426-8847
Email: dave.wehrman2@unisys.com

Mr. Paul D. Aloisi (P)
Unitrode Corporation
MS: 84
7 Continental Blvd
Merrimack, NH 03054
Phone: (603) 429-8687
Fax: (603) 429-8963
Email: aloisi@unitrode.com

Mr. Donald R. Getty (A)
Unitrode Corporation
Suite 220
4010 Moorpark Ave.
San Jose, CA 95117-1843
Phone: (408) 246-3100 x41
Fax: (408) 246-3101
Email: gettd@unitrode.com

Mr. Marq Elliott (O)
Verisys
335-H Spreckels Dr.
Aptos, CA 95003
Phone: (408) 662-7900
Fax:
Email:

Mr. Michael G. Kaminski (O)
Volex Inc.
835 Sinclair Frontage Road
Milpitas, CA 95035
Phone: (408) 945-7766
Fax: (408) 945-4360
Email: Mike_Kaminski@volex.com

Mr. Praveen Viraraghavan (A)
Western Digital Corp.
1599 N Broadway
Rochester, MN 55906
Phone: (507) 286-7668
Fax: (507) 286-7079
Email: Praveen.Viraraghavan@wdc.com

Mr. Jeffrey L. Williams (P)
Western Digital Corporation
1599 N. Broadway Ave.
Rochester, MN 55906
Phone: (507) 286-7589
Fax: (507) 536-8089

Email: Jeffrey.L.Williams@wdc.com

Mr. Doug Piper (P)
Woven Electronics
PO Box 189
Mauldin, SC 29662
Phone: (803) 967-1751
Fax: (803) 963-1761
Email: doug.piper@wovenelectronics.com

Mr. E.J. Mondor (A)
Woven Electronics
PO Box 189
Mauldin, SC 29662
Phone: (803) 967-1739
Fax: (803) 963-1761
Email: 549.9900@mcimail.com

Mr. Harvey Waltersdorf (A#)
Woven Electronics
PO Box 189
Mauldin, SC 29662
Phone: (803) 967-1793
Fax: (803) 963-1761
Email: harvey.waltersdorf@wovenelectronics.com

Mr. Larry Aszmann (O)
Xiotech Corp.
#200
6509 Flying Cloud Dr.
Eden Prairie, MN 55344
Phone: (612) 828-5978
Fax: (612) 828-5990
Email: laszmann@xiotech.com

Mr. Arnold Limjoco (O)
Yamaichi Electronics
2235 Zanker Rd.
San Jose, CA 95131
Phone: (408) 456-0797 x134
Fax: (408) 456-0799
Email: arnold.l@yeu.com