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
lohmeyer@t10.org

NCITS SUBGROUP ANNUAL REPORT

Annual Report for: **T10**
Covering the Period: October 2000 to October 2001
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 45 approved projects, 25 in maintenance mode. Most of the active projects are related to the SCSI-3 family of standards. T10 membership has increased from 39 to 46 organizations.

Over the last few years, there has been increasing interest in attaching storage devices over longer distances using interfaces such as Fibre Channel, InfiniBand (tm), and the internet (e.g., iSCSI). These larger topologies have required some enhancements in the SCSI architecture and the command sets (e.g., access controls, globally unique identifiers, persistent reservations, etc.). Organizations have joined T10 that have not previously participated (e.g., Microsoft, Intel, and Cisco Systems).

II. Projects

1. Storage Module Interfaces (SMD-E)

a. Project 0053-M 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 and current status: Published as X3.91M:1987[1997]; Maintenance Phase.

2. Small Computer System Interface (SCSI-2)

a. Project 0375-M, 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 2004.

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.

There are two Technical Information Bulletins associated with this standard: 1) TIB #1: Logging Operations and 2) TIB #2: Partition Management.

d. Publications During Past Year: none.

e. Statement of Progress and current status: Published as X3.131-1994[1999]; Maintenance Phase.

3. 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 2006.

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 and current status: Published as X3.232:1996 [R2001]; Maintenance Phase.

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

a. Project 0989-M, 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 2006.

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 and current status: Published as X3.295:1996 [R2001]; Maintenance Phase.

5. SCSI-3 Generic Packetized Protocol (GPP)

a. Project 0991-TR, 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 and current status: Published as X3/TR-16-1997; Maintenance Phase.

6. SCSI-3 Fibre Channel Protocol (FCP)

a. Project 0993-M, 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 2006.

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 and current status: Published as X3.269:1996 [R2001]; Maintenance Phase.

7. SCSI-3 Architecture Model (SAM)

a. Project 0994-M, 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 2006.

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 and current status: Published as X3.270:1996 [R2001]; Maintenance Phase.

8. SCSI-3 Primary Commands (SPC)

a. Project 0995-M, 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 2002.

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 and current status: Published as X3.301:1997; Maintenance Phase.

9. SCSI-3 Block Commands (SBC)

a. Project 0996-M, 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 and current status: Published as NCITS.306:1998; Maintenance Phase.

10. SCSI-3 Stream Commands (SSC)

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

b. Target date for dpANS to NCITS:
Original target date:
Previous target date:
Current target date: Maintenance Phase -- 5yr review due in 2005.

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 and current status: Published as NCITS.335:2000; Maintenance Phase.

11. SCSI-3 Medium Changer Commands (SMC)

a. Project 0999-M, 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 and current status: Published as NCITS.314:1998; Maintenance Phase.

12. SCSI-3 Multimedia Commands (MMC)

a. Project 1048-M, 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 and current status: Published as X3.304:1997; Maintenance Phase.

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

a. Project 1051-M, 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 and current status: Published as NCITS.309:1998; Maintenance Phase.

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

a. Project 1121-M, 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 2006.

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 and current status: Published as X3.294:1996 [R2001]; Maintenance Phase.

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

a. Project 1142-M, 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 2003.

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 and current status: Published as X3.302:1998; Maintenance Phase.

16. SCSI Enhanced Parallel Interface Technical Report (EPI)

a. Project 1143-TR, 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 2003.

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 and current status: Published as NCITS TR-23:1998; Maintenance Phase.

17. 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 2001
Current target date: November 2001

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 and current status: One public review comment was received and resolved without substantive changes.

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

a. Project 1145-M, 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 2006.

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 and current status: Published as X3.293:1996 [R2001]; Maintenance Phase.

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

a. Project 1146-M, 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 2002.

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 and current status: Published as NCITS.307:1997; Maintenance Phase.

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

a. Project 1147-M, 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 2002.

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 and current status: Published as NCITS.308:1997; Maintenance Phase.

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

a. Project 1155-M, 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 2003.

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 and current status: Published as NCITS.325:1998; Maintenance Phase.

22. 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 2001
Current target date: March 2002

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 and current status: Project is nearing completion. Delays in defining the multi-port model have caused the bulk of the schedule slip. Expect a SAM-3 project proposal in 1Q02.

23. SCSI Enclosure Services (SES)

a. Project 1212-M, 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 for SES and 2005 for SES/AM1.

c. Project Description: The SES standard defines a model for a SCSI Enclosure Services device type. The command set and command set usage are described. Formats for providing different classes of information are defined. Formats for providing status and control information for each element and type of element in an enclosure are defined. The SES standard uses commands defined in the SPC standard to transfer these formats. Additional formats are provided for other enclosure related information.

d. Publications During Past Year: none.

e. Statement of Progress and current status: SES Amendment #1 was published in late 2000.

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

a. Project 1225-M, 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 and current status: Published as NCITS.318:1998; Maintenance Phase.

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

a. Project 1228-M, Multi-Media Commands - 2 (MMC-2)

b. Target date for dpANS to NCITS:
Original target date:
Previous target date:
Current target date: Maintenance Phase -- 5yr review due in 2005.

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 and current status: Published as NCITS.333:2000; Maintenance Phase.

26. 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: May 2001
Current target date: May 2001

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 and current status: At NCITS for management review. Completed public review with three comments received; no substantive changes were made as a result of these comments, however.

27. Reduced Block Commands (RBC)

a. Project 1240-M, Reduced Block Commands (RBC)

b. Target date for dpANS to NCITS:
Original target date:
Previous target date:
Current target date: Maintenance Phase -- 5yr review due in 2005.

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 and current status: Published as NCITS.330:2000; Maintenance Phase.

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

a. Project 1302-M, SCSI Parallel Interface - 3 (SPI-3)

b. Target date for dpANS to NCITS:
Original target date:
Previous target date:
Current target date: Maintenance Phase -- 5yr review due in 2005.

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 and current status: Published as NCITS.336:2000; Maintenance Phase.

29. Object Based Storage Devices Command Set (OSD)

a. Project 1355-D, Object Based Storage Devices Command Set (OSD)

b. Target date for dpANS to NCITS:
Original target date: November 2003
Previous target date: November 2003
Current target date: November 2003

c. Project Description: The Object Based Storage Device command set would store data objects instead of blocks of data. The purpose of this abstraction is to assign to the storage device more responsibility for managing the location of the data. The advantages for this approach are: (a) easier sharing of files with multiple initiators, (b) sharing of files among initiators that use different operating systems, (c) moving responsibility for data management functions such as defragmentation to the storage device, and (d) easier implementation of third party backup and restore operations.

d. Publications During Past Year: none.

e. Statement of Progress and current status: Ralph Weber has agreed to be the OSD Project Editor following Gene Milligan's death. The project is still on schedule in spite of this setback. We recently established a liaison with H2.

30. 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: July 2001
Current target date: November 2001

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 and current status: Resolving T10 letter ballot comments.

31. 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: November 2001
Current target date: January 2002

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 and current status: The T10 letter ballot on forwarding SPI-4 closes October 29, 2001.

32. SCSI Domain Validation Technical Report (SDV)

a. Project 1378-D, SCSI Domain Validation Technical Report (SDV)

b. Target date for dpANS to NCITS:
Original target date: November 2001
Previous target date: November 2001
Current target date: January 2002

c. Project Description: The SCSI Domain Validation (SDV), is an application of testing techinques to validate the communication capability of the SCSI physical layer. Some of the techiques 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 and current status: The T10 letter ballot on forwarding SDV closes October 19, 2001.

33. SCSI on Scheduled Transfer (SST)

a. Project 1380-D, SCSI on Scheduled Transfer (SST)

b. Target date for dpANS to NCITS:
Original target date: November 2000
Previous target date: November 2001
Current target date: November 2001

c. Project Description: This project proposal recommends the development of a mapping for SCSI Architecture and commands onto the facilities provided by Scheduled Transfer (ST). The Scheduled Transfer (ST) project (assigned to T11.1) defines a local transport mechanism for use on several media including the High-Performance Parallel Interface (HIPPI), HIPPI-6400, Fibre Channel, and Ethernet. ST allows maximum network performance. It achieves this by scheduling transfers and sending data only when end devices can accept it.

d. Publications During Past Year: none.

e. Statement of Progress and current status: Resolving T10 letter ballot comments.

34. SCSI Medium Changer Commands - 2 (SMC-2)

a. Project 1383-D, SCSI Medium Changer Commands - 2 (SMC-2)

b. Target date for dpANS to NCITS:
Original target date: January 2001
Previous target date: November 2001
Current target date: March 2002

c. Project Description: The Media Changers Command set version 2 is based on SCSI Medium Changers Command set version 1 that provides commands to implement changer devices for removable media This command set may be implemented on multiple interfaces such as SCSI,

Fibre Channel, IEEE 1394 and ATA/ATAPI. The following items should be considered for inclusion in SMC-2: 1) Improving operation with serial interconnects; 2) handling interconnected changer devices, 3) improved reporting of error conditions, 4) other capabilities that may fit within the general application scope of this project.

d. Publications During Past Year: none.

e. Statement of Progress and current status: Development nearing completion.

35. SCSI Signal Modeling (SSM)

a. Project 1414-DT, SCSI Signal Modeling (SSM)

b. Target date for dpANS to NCITS:
Original target date: September 2001
Previous target date: September 2001
Current target date: November 2001

c. Project Description: The SCSI Signal Modeling Technical Report (SSM) is a collection of requirements on methodologies to be used to simulate SCSI signals. These methodologies support the current family of SCSI standards and are designed to work at the data rates expected to be specified through 2006. The following items may be considered for inclusion in SSM: 1. Methodologies and models for all the types of components that exist in a SCSI signal path; 2. Simulation tools; 3. Benchmark data patterns; 4. Benchmark test configurations; 5. Output types and formats; 6. Output evaluation schemes; 7. Evaluation of signaling methodologies (encoding, ISI compensation, etc.); 8. Physical measurement / simulation correlation; 9. Definitions for terms and concepts of signal integrity (SNR, random and deterministic jitter); 10. Translation between component manufacturing control parameters and simulation input parameters; 11. Other capabilities that may fit within the general application scope of this project.

d. Publications During Past Year: none.

e. Statement of Progress and current status: Resolving T10 letter ballot comments.

36. SCSI RDMA Protocol (SRP) [was SCSI VI Protocol (SVP)]

a. Project 1415-D, SCSI RDMA Protocol (SRP)

b. Target date for dpANS to NCITS:
Original target date: January 2001
Previous target date: July 2001
Current target date: January 2002

c. Project Description: Much clustering communication takes place at application or file system levels. However many clustering applications may require frequent device level access as well. A standard SCSI protocol for use on Remote Direct-Memory Access (RDMA) interfaces such as InfiniBand (tm) will aid interoperability and assist future development of clustering technology. The SCSI RDMA Protocol (SRP) will define a SCSI protocol mapping onto the InfiniBand (tm) Architecture and/or functionally similar cluster protocols. The SCSI RDMA Protocol will allow the SCSI architecture and command sets to be used with any implementation of interfaces using the RDMA architecture.

d. Publications During Past Year: none.

e. Statement of Progress and current status: Project renamed in November 2000. Currently at T10 letter ballot, which closes November 2, 2001.

37. SCSI Primary Commands - 3 (SPC-3)

a. Project 1416-D, SCSI Primary Commands - 3 (SPC-3)

b. Target date for dpANS to NCITS:
Original target date: July 2002
Previous target date: November 2002
Current target date: July 2003

c. Project Description: Technological advances require continuing improvements in the set of SCSI commands employed by all SCSI device types. After the publication of SPC-2, SPC-3 will provide the vehicle for standardizing the needed improvements. The SCSI Primary Commands-3 standard is intended to include additional commands as well as existing SCSI 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 Primary Commands to another standard or to make some information obsolete in SPC-3. The following items should be considered for inclusion in SPC-3: 1) Moving some information in SAM-2 to SPC-3 to reduce the rate of change in the architecture model document; 2) New additional sense code values; 3) New mode page definitions or new fields in existing mode pages; 4) New fields in the parameter data returned by the INQUIRY and REQUEST SENSE commands; 5) New vital product data pages; 6) New commands appropriate for all SCSI device types; 7) Other capabilities that may fit within the general application scope of this project.

d. Publications During Past Year: none.

e. Statement of Progress and current status: In development. Slips due to delays in approving SPC-2.

38. SCSI Block Commands - 2 (SBC-2)

a. Project 1417-D, SCSI Block Commands - 2 (SBC-2)

b. Target date for dpANS to NCITS:
Original target date: July 2002
Previous target date: November 2001
Current target date: November 2003

c. Project Description: The SCSI Block Commands - 2 is based on SCSI-3 Block Commands (SBC) that provides commands for block structured data storage devices such as magnetic disks and optical memory block devices. This command set may be implemented on multiple interfaces such as SCSI, Fibre Channel, IEEE 1394 and ATA/ATAPI. The following items should be considered for inclusion in SBC-2: 1) Support for media capacities larger than 2 terabytes; 2) Control commands to manage the operation of a device; 3) Other capabilities that may fit within the general application scope of this project.

d. Publications During Past Year: none.

e. Statement of Progress and current status: Development has begun. Rob Elliott has agreed to be the SBC-2 Project Editor following Gene Milligan's death. The big slip is mostly due to fewer changes than originally anticipated -- there is no point in releasing SBC-2 too early for the market needs.

39. SCSI Stream Commands - 2 (SSC-2)

a. Project 1434-D, SCSI Stream Commands - 2 (SSC-2)

b. Target date for dpANS to NCITS:
Original target date: March 2001

Previous target date: November 2001
Current target date: March 2002

c. Project Description: The SCSI Stream Commands - 2 is based on SCSI-3 Stream Commands (SSC) that provides commands for stream devices such as sequential-access tape drives and printers. This command set may be implemented on multiple interfaces such as SCSI, Fibre Channel, IEEE 1394 and ATA/ATAPI. The following items should be considered for inclusion in SSC-2: 1) Support for large block addresses; 2) Additional command support; SET CAPACITY; 3) Other capabilities that may fit within the general application scope of this project.

d. Publications During Past Year: none.

e. Statement of Progress and current status: Development is nearly complete.

40. SCSI Passive Interconnect Performance (PIP) Technical Report

a. Project 1439-D, SCSI Passive Interconnect Performance (PIP)

b. Target date for dpANS to NCITS:
Original target date: January 2002
Previous target date:
Current target date: January 2002

c. Project Description: The SCSI Passive Interconnect Performance Standard (PIP) is a collection of requirements on methodologies to be used to measure the performance of passive SCSI interconnect components such as cable assemblies and backplanes. This work extends previous work for uniform transmission media to the completed interconnect parts that have connectors and other assembly features. These methodologies support the current family of SCSI standards and are designed to work at the data rates expected to be specified through 2007. The following items may be considered for inclusion in PIP: 1) Define how to specify the output signal from a cable assembly in light of the possible use of adjustable active filtering (called equalization by some) in receivers; 2) Allow for the following schemes that are presently being considered for SPI-4: transmitter compensation, adaptive adjustable filtering, compensation of skew; 3) Define how to specify cable assembly construction in terms of performance rather than only in mechanical terms. For example, connector to connector spacing in terms of propagation time rather than length, transition regions in terms of cross talk contribution rather than physical extent, discontinuities in impedance due to connectors rather than nothing, etc.; 4) Preserve the present testing methodologies for media if possible; 5) Specify output types and formats; 6) Specify output evaluation schemes; 7) Define worst case configurations: loading, spacing (regular or not, values); 8) Define interoperability points that involve passive interconnect; 9) Rules for concatenation of passive interconnect components; 10) Extend currently specified tests for media to completedFor example, the attenuation test can be generalized to two port amplitude transfer function (which will include resonance caused by connectors etc). The cross talk test can be generalized by using repeated pulses and varying the rep rate while observing the response of on the victim line; 11) Include the effects of data pattern and placement of cable assembly features that may produce complex interference patterns and recommend how to minimize the impact of these features on the delivered signal; 12) Use the same test specification documentation methodology as used for SPI-3 cable media.; 13) Measurement of common mode performance requirements on shielded and unshielded cable assemblies and backplanes; 14) Other capabilities that may fit within the general application scope of the this project.

d. Publications During Past Year: none.

e. Statement of Progress and current status: Changed from a technical report project to a standard project. Development has begun.

41. Serial Bus Protocol - 3 (SBP-3)

a. Project 1467-D, Serial Bus Protocol - 3 (SBP-3)

b. Target date for dpANS to NCITS:
Original target date: May 2002
Previous target date:
Current target date: May 2002

c. Project Description: The SBP-3 standard will define transport layer protocols to take advantage of both implementation experience gained with ANSI NCITS.325:1998 and the continued evolution of High Performance Serial Bus, IEEE Std 1394-1995 as amended by IEEE Std 1394a-2000. Candidates for inclusion in the SBP-3 standard are: a) methods to reduce a target's start-up latency from an idle condition; b) explicit description of the methods used to encapsulate 16-byte or larger command descriptor blocks (CDBs) within SBP-3; c) extensions necessary for initiators and targets to successfully interoperate across one or more Serial Bus bridges as specified by draft standard IEEE p1394.1; d) isochronous facilities and methods, with particular attention to data interchange formats that permit the use of removable media; e) definition of a new ORB type to permit bi-directional data transfer in the context of a single task; f) revisions necessary to utilize new Serial Bus features specified by IEEE Std 1394a-2000 and draft standard IEEE P1394b; g) clarifications and corrigenda applicable to ANSI NCITS 325-1998; and h) other capabilities which fit within the general application scope of ANSI NCITS.325:1998 that may be proposed during the development phase by the participants in the project. The SBP-3 standard is intended to be compatible with ANSI NCITS.325:1998; it is anticipated that a device conformant with the current standard will also be conformant with SBP-3.

d. Publications During Past Year: none.

e. Statement of Progress and current status: Development is underway.

42. SCSI Signal Modeling - 2 (SSM-2)

a. Project 1514-D, SCSI Signal Modeling - 2 (SSM-2)

b. Target date for dpANS to NCITS:
Original target date: September 2003
Previous target date:
Current target date: September 2003

c. Project Description: The SCSI Signal Modeling-2 standard (SSM-2) is a collection of requirements on methodologies to be used to simulate SCSI signals and SCSI bus components. These methodologies support the current family of SCSI the following items may be considered for inclusion in SSM-2: 1) IBIS-x based models and system modeling; 2) methodologies, common format for models, models and validation of the models for all the types of components that exist in a SCSI signal bus segment; 3) simulation tools; 4) benchmark data patterns; 5) benchmark test configurations; 6) output types and formats; 7) output evaluation schemes; 8) evaluation of signaling methodologies (encoding, ISI compensation, etc.); 9) physical measurement / simulation correlation of system models; 10) definitions for terms and concepts of signal integrity (SNR, random and deterministic jitter); 11) translation between component manufacturing control parameters and simulation input parameters; 12) other capabilities that may fit within the general application scope of the this project.

d. Publications During Past Year: none.

e. Statement of Progress and current status: Development is underway.

43. SCSI RDMA Protocol - 2 (SRP-2)

a. Project 1524-D, SCSI RDMA Protocol - 2 (SRP-2)

b. Target date for dpANS to NCITS:
Original target date: December 2002
Previous target date:
Current target date: December 2002

c. Project Description: The SCSI RDMA Protocol – 2 is the next generation of SCSI RDMA protocol. The following items should be considered for inclusion in SRP-2: 1) support for using multiple channels; and 2) other capabilities that may fit within the general application scope of this project.

d. Publications During Past Year: none.

e. Statement of Progress and current status: Development is waiting for Project 1415-D, SRP, to be completed.

44. SCSI Parallel Interface - 5 (SPI-5)

a. Project 1525-D, SCSI Parallel Interface - 5 (SPI-5)

b. Target date for dpANS to NCITS:
Original target date: November 2003
Previous target date:
Current target date: November 2003

c. Project Description: The SCSI Parallel Interface - 5 (SPI-5), is based on low-voltage differential (LVD) technology and is designed to provide a 640 MB/sec data rate and may provide the groundwork for future generations of the SCSI parallel interface. In addition to doubling the existing data rate of SPI-4, the following items may be considered for inclusion in SPI-5: 1) physical layer signal integrity enhancements; 2) error recovery protocol and error rate characterization; 3) reevaluate requirements for 5-volt tolerance and single-ended compatibility; and 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 and current status: Development is underway.

45. SCSI Management Server Commands (MSC)

a. Project 1528-D, SCSI Management Server Commands (MSC)

b. Target date for dpANS to NCITS:
Original target date: July 2002
Previous target date:
Current target date: July 2002

c. Project Description: The SCSI Management Server Commands standard defines commands for SCSI protocol bridge controller devices that bridge between SCSI protocols like SPI, FCP, SRP, and iSCSI and defines commands useful for other device types. The following items should be considered for inclusion in MSC: 1) support bridging between SPI, FCP, SRP, and iSCSI; 2) support SCSI parallel interface LUN bridges as described in EPI; 3) use the “bridging expanders” device type reserved in SPC-2 by EPI; 4) provide interfaces to fabric name servers like the Fibre Channel name server, InfiniBand configuration manager, and TCP/IP iSNS name server; 5) support devices that present one target with multiple LUNs; 6) support devices that present multiple targets with

multiple LUNs; 7) commands for discovery of targets and LUNs on remote busses; 8) commands for managing mapping of remote targets and LUNs through bridge devices; 9) commands for managing remote bus initiator operation and reporting status (e.g. on a bridge to SPI, the PPR negotiated settings with each target); 10) other capabilities that may fit within the general application scope of this project.

d. Publications During Past Year: none.

e. Statement of Progress and current status: Development has not begun.

III. Committee Activities

a. Previous Year's Meetings:

#40 November 2, 2000, Monterey, CA
#41 January 18, 2001; Orlando, FL
#42 March 8, 2001; Dallas, TX
#43 May 3, 2001; Nashua, NH
#44 July 19, 2001; Colorado Springs, CO
#45 September 13, 2001, Huntington Beach, CA

b. Current Year's Planned Meetings T10:

#46 November 8, 2001, Monterey, CA
#47 January 17, 2002; Houston, TX
#48 March 14, 2002; Dallas, TX
#49 May 9, 2001; Nashua, NH (this date will likely change to May 2, 2002)
#50 July 18, 2002; Colorado Springs, CO
#51 September 12, 2001, Minneapolis, MN (?)
#52 November 7, 2001, Huntington Beach, CA

c. T10 Officers:

Chair:	John B. Lohmeyer
Vicechair:	George O. Penokie
Secretary:	Ralph O. Weber
International Representative:	Gary S. Robinson

d. Membership: The current T10 membership list is attached.

e. Liaison Activities: T11, T13, ISO/IEC JTC1/SC25/WG4, IEEE P1394.1, IETF, NCITS H2.

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 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., much larger address spaces, DVDs, CD-Recordable devices, and array controllers) as well as refinements to deal with current interconnect issues (e.g., network storage, security, and power management).

Attachment 1: Committee Projects: SD-4 Data

The NCITS Secretariat provided the following data:

T10/SC25/WG4 Lower Level Interface
(Revised 10/05/01) NCITS Project: 53 - M
Standard Designation: X3.91M:1987 [R1997]

Title: Storage Module Interfaces (SMD-E)

Related International Development
ISO/IEC Doc.: JTC 1 Project:

-
NCITS Project: 375 - M
Standard Designation: X3.131:1994 [R1999]

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 [R2001]

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: 989 - M
Standard Designation: X3.295:1996 [R2001]

Title: Serial Storage Architecture - Transport Layer (SSA-TP1)

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 Protocal (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 [R2001]

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 [R2001]

Title: SCSI-3 Architecture Model (SAM)

Related International Development
ISO/IEC Doc.: IS 14776-411
JTC 1 Project: 25.13.11.08

-
NCITS Project: 995 - M
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 - M
Standard Designation: NCITS 306:1998 []

Title: SCSI-3 Block Commands (SBC)

Related International Development
ISO/IEC Doc.: FDIS 14776-321
JTC 1 Project: 25.13.11.10

NCITS Project: 997 - M
Standard Designation: NCITS 335:2000 []

Title: Information technology - SCSI-3 Stream Commands (SSC)

Related International Development
ISO/IEC Doc.: FCD 14776-331
JTC 1 Project: 25.13.11.11

-
NCITS Project: 999 - M
Standard Designation: NCITS 314:1998 []

Title: SCSI-3 Medium Changer Commands (SMC)

Related International Development
ISO/IEC Doc.: CD 14776-351
JTC 1 Project: 25.13.11.13

-
NCITS Project: 1048 - M
Standard Designation: X3.304:1997 []

Title: SCSI-3 Multimedia Commands (MMC)

Related International Development
ISO/IEC Doc.: JTC 1 Project: N/A

NCITS Project: 1051 - M
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: 1121 - M
Standard Designation: X3.294:1996 [R2001]

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 - M
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: 25.13.11.21

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: NCITS 350: []

Title: SCSI Fibre Channel Protocol - 2 (FCP-2)

Related International Development
ISO/IEC Doc.: JTC 1 Project: 25.13.11.18

-
NCITS Project: 1145 - M

Standard Designation: X3.293:1996 [R2001]

Title: Serial Storage Architecture - Physical Layer 1 (SSA-PH1)

Related International Development
ISO/IEC Doc.: JTC 1 Project:

NCITS Project: 1146 - M
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 - M
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 - M
Standard Designation: NCITS 325:1998 []

Title: SCSI-3 Serial Bus Protocol 2 (SBP-2)

Related International Development
ISO/IEC Doc.: DIS 14776-232
JTC 1 Project: 25.13.11.20

NCITS Project: 1157 - D
Standard Designation: : []

Title: SCSI Architecture Model-2 (SAM-2)

Related International Development
ISO/IEC Doc.: JTC 1 Project:

-
NCITS Project: 1212 - M
Standard Designation: NCITS 305:1998/AM1:2000 []

Title: Information Technology - SCSI - Enclosure Services (SES) - Amendment 1

Related International Development
ISO/IEC Doc.: JTC 1 Project:

Standard Designation: NCITS 305:1998 []

Title: SCSI Enclosure Services (SES)

Related International Development
ISO/IEC Doc.: CD 14776-371
JTC 1 Project: 25.13.11.22

-
NCITS Project: 1225 - M
Standard Designation: NCITS 318:1998 []

Title: SCSI Controller Commands - 2 (SCC-2)

Related International Development
ISO/IEC Doc.: CD 14776-342
JTC 1 Project: 25.13.11.23

NCITS Project: 1228 - M
Standard Designation: NCITS 333:2000 []

Title: SCSI Multi-Media Commands - 2 (MMC-2)

Related International Development
ISO/IEC Doc.: FDIS 14776-362
JTC 1 Project: 25.13.11.24

-
NCITS Project: 1236 - D
Standard Designation: NCITS 351: []

Title: SCSI Primary Commands - 2 (SPC-2)

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

NCITS Project: 1240 - M

Standard Designation: NCITS 330:2000 []

Title: Reduced Block Commands (RBC)

Related International Development
ISO/IEC Doc.: FCD 14776-326
JTC 1 Project: 25.13.11.25

-
NCITS Project: 1302 - M
Standard Designation: NCITS 336:2000 []

Title: Information technology - SCSI Parallel Interface-3 (SPI-3)

Related International Development
ISO/IEC Doc.: FCD 14776-326
JTC 1 Project: 25.13.11.25

NCITS Project: 1355 - D
Standard Designation: : []

Title: Information technology - Object Based Storage Devices Command Set (OSD)

Related International Development
ISO/IEC Doc.: JTC 1 Project:

-
NCITS Project: 1363 - D
Standard Designation: : []

Title: MultiMedia Command Set-3 (MMC-3)

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:

-

NCITS Project: 1378 - DT
Standard Designation: : []

Title: SCSI Domain Validation (SDV)

Related International Development
ISO/IEC Doc.: JTC 1 Project:

-
NCITS Project: 1380 - D
Standard Designation: : []

Title: Information Technology - Small Computer Systems Interface (SCSI) on Scheduled
Transport (ST) (SST)

Related International Development
ISO/IEC Doc.: JTC 1 Project:

NCITS Project: 1383 - D
Standard Designation: : []

Title: Information technology - SCSI Media Changer Command Set version 2 (SMC-2)

Related International Development
ISO/IEC Doc.: JTC 1 Project:

-
NCITS Project: 1414 - DT
Standard Designation: : []

Title: Information technology - SCSI Signal Modeling (SSM) Technical Report
[**For Additional Information**]

Related International Development
ISO/IEC Doc.: JTC 1 Project:

-
NCITS Project: 1415 - D
Standard Designation: : []

Title: Information technology - SCSI VI Protocol (SVP)

Related International Development
ISO/IEC Doc.: JTC 1 Project:

NCITS Project: 1416 - D
Standard Designation: : []

Title: Information technology - SCSI Primary Commands - 3 (SPC-3)

Related International Development
ISO/IEC Doc.: JTC 1 Project:

-
NCITS Project: 1417 - D
Standard Designation: : []

Title: Information technology - SCSI Block Commands - 2 (SBC-2)

Related International Development
ISO/IEC Doc.: JTC 1 Project:

-
NCITS Project: 1434 - D
Standard Designation: : []

Title: Information technology - SCSI Stream Commands -2 (SSC-2)

Related International Development
ISO/IEC Doc.: JTC 1 Project:

NCITS Project: 1439 - D
Standard Designation: : []

Title: Information Technology - SCSI Passive Interconnect Performance (PIP)

Related International Development
ISO/IEC Doc.: JTC 1 Project:

-
NCITS Project: 1467 - D
Standard Designation: : []

Title: Information technology - Serial Bus Protocol 3 (SBP-3)

Related International Development
ISO/IEC Doc.: JTC 1 Project:

-
NCITS Project: 1514 - D

Standard Designation: : []

Title: Information technology, SCSI Signal Modeling (SSM-2)

Related International Development
ISO/IEC Doc.: JTC 1 Project:

NCITS Project: 1524 - D
Standard Designation: : []

Title: Information technology, SCSI RDMA Protocol - 2 (SRP-2)

Related International Development
ISO/IEC Doc.: JTC 1 Project:

-
NCITS Project: 1525 - D
Standard Designation: : []

Title: Information technology, SCSI Parallel Interface - 5 (SPI-5)

Related International Development
ISO/IEC Doc.: JTC 1 Project:

-
NCITS Project: 1528 - D
Standard Designation: : []

Title: Information Technology - SCSI Management Server Commands (MSC)

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.00/00-283r1.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
T10 Plenary Meetings & Accompanying Meeting Weeks:	ftp://ftp.t10.org/t10/document.00/00-221r2.pdf

Attachment 3: Financial Statement

The NCITS Secretariat maintains an escrow account on T10's behalf to pay for technical editing services. See the T10 Procedure for Funding Technical Editors <ftp://ftp.t10.org/t10/document.95/95-148r0.pdf> for details of how this account is administered. The current account balance as of October 11, 2001 is $31,830.75.

Attachment 4: 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 2001/10/09 at 15:31:48.)

Mr. Ron Roberts     (P)
Adaptec, Inc.
691 S. Milpitas Blvd.
Milpitas, CA 95035
Phone: (408) 957-5640
  Fax: (530) 677-1218
Email: Ron_Roberts@adaptec.com

Mr. Ram Rangarajan     (AV)
Advansys
1150 Ringwood Ct.
San Jose, CA 95131
Phone: (408) 383-5719
  Fax: (408) 383-9612
Email: rrangarajan@advansys.com

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

Mr. Litko Chan     (AV)
Agilent Technologies
3175 Bowers Ave., MS 88R
Santa Clara, CA 95054
Phone: (408) 970-3020
  Fax:
Email: lito_chan@agilent.com

Mr. Matt Wakeley     (AV)
Agilent Technologies
1101 Creekside Ridge Dr #100
```

P.O. Box 619051
Roseville, CA 95661-9051
Phone: (916) 788-5670
  Fax:
Email: matt_wakeley@agilent.com

Mr. Michael Wingard (P)
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. Ward Winburn (A)
Ancot Corp.
115 Constitution Dr.
Menlo Park, CA 94025
Phone: (650) 322-5322
  Fax: (650) 322-0455
Email: ward@ancot.com

Dr. Claudio DeSanti (P)
Andiamo Systems, Inc.
375 E. Tasman Dr.
San Jose, CA 95134
Phone: (408) 853-9172
  Fax: (408) 853-9172
Email: cds@andiamo.com

Mr. Dinesh Dutt (A)
Andiamo Systems, Inc.
375 E. Tasman Dr.
San Jose, CA 95134
Phone: (408) 527-0955
  Fax: (408) 527-0955
Email: ddutt@andiamo.com

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

Mr. James R. Bergsten (AV)
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. Vince Bastiani (A)
Bass Technology Consulting
49380 Mission Drive West
La Quita, CA 92253
Phone: (760) 777-1550

Fax:
Email: bass.tech@gte.net

Mr. Brian A. Berg (AV)
Berg Software Design
P.O. Box 3488
14500 Big Basin Way, Suite F
Saratoga, CA 95070
Phone: (408) 741-5010
Fax: (408) 741-5234
Email: bberg@bswd.com

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. Robert Snively (P)
Brocade Comm. Systems, Inc.
1745 Technology Drive
San Jose, CA 95110
Phone: (408) 487-8135
Fax: (408) 392-6676
Email: rsnively@brocade.com

Mr. Joseph Basista (AV)
C&M Corp.
49 Middle Road
Owego, NY 13827
Phone: (607) 687-1044
Fax: (607) 687-7534
Email: joebasista@aol.com

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

Mr. Leroy Fong (AV)
Circuit Assembly Corp.
18 Thomas St.
Irvine, CA 92618
Phone: (949) 855-7887
Fax: (949) 837-8660
Email: leroyf@circuitassembly.com

Mr. Dennis Lang (AV)
Circuit Assembly Corp.
18 Thomas St.
Irvine, CA 92618
Phone: (949) 855-7887
Fax: (949) 855-4298
Email: dennisl@circuitassembly.com

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

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

Mr. David Peterson (P)
Cisco Systems, Inc.
6450 Wedgwood Road
Maple Grove, MN 55311
Phone: (612) 802-3299
Fax: (763) 398-1001
Email: dap@cisco.com

Mr. Edward Haske (AV)
CMD Technology
1 Vanderbilt
Irvine, CA 92718
Phone: (949) 454-0800
Fax: (949) 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

Dr. William Ham (A)
Compaq Computer Corp.
SHR3-2/W04
334 South Street
Shrewsbury, MA 01545
Phone: (978) 828-9102
Fax: (508) 841-5266
Email: bill_ham@ix.netcom.com

Mr. Peter Johansson (P)
Congruent Software, Inc.
98 Colorado Avenue
Berkeley, CA 94707
Phone: (510) 527-3926
Fax: (510) 527-3856
Email: PJohansson@ACM.org

Mr. Robert Griswold (P)
Crossroads Systems, Inc.
8300 N. Mopac Blvd.
Austin, TX 78759
Phone: (512) 928-7272
Fax: (512) 928=7403
Email: rgriswold@crossroads.com

Mr. John Tyndall (A)
Crossroads Systems, Inc.
8300 North Mopac Expressway
Austin, TX 78749
Phone:
Fax:
Email: jtyndall@crossroads.com

Mr. Titkwan Hui (P)
Dallas Semiconductor
4401 S. Beltwood Pkwy.
Dallas, TX 75244-3292
Phone: (972) 371-4340
Fax: (972) 371-4370
Email: tk.hui@dalsemi.com

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

Mr. Kevin Marks (P)
Dell Computer Corp.
One Dell Way
Round Rock, TX 78682
Phone: (512) 723-8784
Fax: (512) 723-6657
Email: kevin_marks@dell.com

Mr. Ronald Stockford (A)
Dell Computer Corp.
One Dell Way
MS 8530
Round Rock, TX 78682
Phone: (512) 728-2636
Fax: (512) 289-1111
Email: ron_stockford@dell.com

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

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

Mr. Gary S. Robinson (P)
EMC
228 South St.
Hopkinton, MA 01748
Phone: (508) 435-1000 x21610
Fax:
Email: robinson_gary@emc.com

Mr. David Black (A)

EMC Corp.
42 South St.
Hopkinton, MA 01748
Phone: (508) 435-1000 x75140
  Fax: (508) 497-6909
Email: black_david@emc.com

Mr. Robert H. Nixon (P)
Emulex
3535 Harbor Blvd
Costa Mesa, CA 92626
Phone: (714) 513-8117
  Fax: (714) 513-8265
Email: bob.nixon@emulex.com

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

Mr. Ralph O. Weber (P)
ENDL Texas
Suite 102#178
18484 Preston Rd.
Dallas, TX 75252
Phone: (214) 912-1373
  Fax: (972) 596-2775
Email: roweber@acm.org

Mr. Alan Johnson (AV)
Eurologic Systems Ltd.
South County Business Park
Leopardstown
County Dublin Ireland
Phone:
  Fax: 43 53 1 206 1200
Email: ajohnson@eurologic.com

Mr. Joe Breher (P)
Exabyte Corp.
1685 38th Street
Boulder, CO 80301
Phone: (303) 417-5897
  Fax: (303) 417-7829
Email: joebre@exabyte.com

Mr. Carl Mozingo (A)
Exabyte Corp.
1685 38th Street
Boulder, CO 80301
Phone:
  Fax:
Email: carlm@exabyte.com

Mr. Douglas Wagner (P)
FCI
472 Delwood Ct.
Newbury Park, CA 91320-4819
Phone: (805) 498-0325
  Fax: (805) 498-0702
Email: dwagner@fciconnect.com

Mr. Jim Koser (A)
FCI

825 Old Trail Road
Etters, PA 17319
Phone: (717) 938-7679
  Fax: (717) 938-7991
Email: jkoser@fciconnect.com

Mr. Steve Wong (A#)
FCI
5700 Warland Dr.
Cypress, CA 90630
Phone: (562) 356-2527
  Fax: (562) 356-2520
Email: sywong@fciconnect.com

Mr. Julian Ferry (AV)
Foxconn I/O
140 Coffeetown Rd.
Dillsburg, PA 17019
Phone: (717) 502-0784
  Fax: (717) 502-1474
Email: julferry@aol.com

Mr. Stephen Jarvis (AV)
Foxconn I/O
6125 Phyllis Drive
Cypress, CA 90630
Phone: (714) 890-8628 x230
  Fax: (714) 892-8668
Email: s.jarvis@foxconn.com

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

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

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

Mr. Mike Fitzpatrick (AV)
Fujitsu
2904 Orchard Pkwy.
San Jose, CA 95134
Phone: (405) 755-7177
  Fax: (405) 755-8073
Email: mfitzpatrick@fcpa.fujitsu.com

Mr. Kazuo Nakashima (AV)
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 (AV)
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: (952) 921-6635
  Fax: (952) 921-6345
Email: nathan.j.hastad@gd-is.com

Mr. Tim Mackley (A)
General Dynamics
8800 Queen Ave. S.
Bloomington, MN 55431
Phone: (952) 921-6866
  Fax:
Email: timothy.a.mackley@gd-is.com

Mr. Donald Woelz (P)
Genroco, Inc.
255 Info Highway
Slinger, WI 53086
Phone: (262) 644-2505
  Fax: (262) 644-6667
Email: don@genroco.com

Mr. Pak Chan (AV)
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 (AV)
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. Randy Haagens (P)
Hewlett Packard Co.
8000 Foothills Blvd. MS 5668
Roseville, CA 95747
Phone: (916) 785-4578
  Fax: (916) 785-0391
Email: randy_haagens@hp.com

Mr. Bill Hooper (A)
Hewlett Packard Co.
8000 Foothills Blvd.
Roseville, CA 95747
Phone: (916) 785-5135
Fax: (916) 785-4176
Email: bill_hooper@hp.com

Mr. Chuck Rice (A#)
Hewlett Packard Co.
18110 SE 34th Street
Vancouver, WA 98683
Phone: (360) 212-0348
Fax:
Email: chuck_rice2@vcd.hp.com

Mr. Brad Culp (AV)
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 (AV)
Hewlett Packard Co.
Filton Road
Stoke Gifford
Bristol BS12 6QZ England
Phone:
Fax:
Email:

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

Mr. Randy Wasylak (A)
Hitachi Cable Manchester
900 Holt Ave.
Manchester, NH 03109-5604
Phone: (603) 669-4347 x349
Fax: (603) 669-9621
Email: rwasylak@hcm.hitachi.com

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

Mr. Terry Enright (AV)

Honda Connectors
960 Corporate Woods Parkway
Vernon Hill, IL 60061
Phone: (847) 913-9566
  Fax: (847) 913-9587
Email:

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

Mr. George O. Penokie (P)
IBM / Tivoli Systems
MS 2C6
3605 Highway 52 N.
Rochester, MN 55901
Phone: (507) 253-5208
  Fax: (507) 253-2880
Email: gop@us.ibm.com

Mr. John P. Scheible (A)
IBM Corp.
Bldg 815 MS 4051
11400 Burnett Rd.
Austin, TX 78758
Phone: (512) 918-3187
  Fax: (512) 823-0758
Email: Scheible@vnet.ibm.com

Mr. Kevin Butt (AV)
IBM Corp.
M/S 9032-2 65U
9000 S. Rita Rd.
Tucson, AZ 85744
Phone: (520) 799-5280
  Fax:
Email: kdbutt@us.ibm.com

Mr. Bill Troop (AV)
IBM Corp.
3039 Cornwallis Rd.
MS: FROA/B205
RTP, NC 27709
Phone: (919) 254-2695
  Fax:
Email: troop@us.ibm.com

Mr. Cris Simpson (P)
Intel Corp.
2111 N.E. 25th Ave.
JF5-355
Hillsboro, OR 97124
Phone: (503) 712-4333
  Fax: (503) 712-2200
Email: cris.simpson@intel.com

Mr. Tim Bradshaw (P)
Iomega Corp.
1821 Iomega Way
Roy, UT 84067
Phone: (801) 332-4262
  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 (AV)
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 (AV)
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: lohmeyer@t10.org

Mr. William Petty (A)
LSI Logic Corp.
4420 ArrowsWest Dr.
Colorado Springs, CO 80907
Phone: (719) 533-7461
Fax: (719) 533-7180
Email: william.petty@lsil.com

Ms. Jie Fan (A)
Madison Cable Corp.
125 Goddard Memorial Dr.
Worchester, MA 01603
Phone: (508) 752-2884 x306
Fax: (508) 752-4230
Email: jie.fan@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 (AV)
Matsushita Elec. Indust. Co.
4-16-12
Matsuo-cho
Kadoma, Osaka 571-8504 Japan
Phone: +81-6-6906-2330
  Fax: +81-6-906-1549
Email: aiai@dsd.mei.co.jp

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

Mr. Mark Evans (P)
Maxtor Corp.
500 McCarthy Blvd.
Milpitas, CA 95035
Phone: (408) 894-5310
  Fax: (408) 324-7432
Email: mark_evans@maxtor.com

Mr. Lance Flake (A#)
Maxtor Corp.
2190 Miller Dr.
Longmont, CO 80501
Phone: (303) 702-3802
  Fax:
Email: lance_flake@maxtor.com

Mr. Pete McLean (A)
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 (AV)
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 (AV)
Mercury Computer
199 Riverneck Road
Chelmsford, MA 01824

Phone: (508) 256-1300 x134
  Fax:
Email:

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

Ms. Emily Hill (P)
Microsoft Corp.
1 Microsoft Way
Redmond, WA 98052
Phone: (425) 705-9595
  Fax: (425) 936-7329
Email: emhill@microsoft.com

Mr. Rob Haydt (A)
Microsoft Corp.
1 Microsoft Way
Redmond, WA 98052
Phone: (425) 705-7639
  Fax: (425) 936-7329
Email: robhay@microsoft.com

Mr. Jay Neer (P)
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. Glen Griessler (A)
Molex Inc.
2222 Wellington Court
Lisle, IL 60532
Phone: (630) 527-4536
  Fax: (630) 969-1352
Email: ggriessler@molex.com

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

Mr. Martin Ogbuokiri (AV)
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 (AV)
Montrose/CDT
28 Sword Street
Auburn, MA 01501
Phone: (508) 791-3161

  Fax: (508) 798-8353
Email: rwagner@montrose-cdt.com

Mr. Brian McKean (A#)
Mylex Corp.
4900 Pearl East Circle #104
Boulder, CO 80301-6108
Phone: (303) 381-4246
  Fax: (303) 413-0464
Email: brianm@mylexboulder.com

Mr. Dave Ford (AV)
Network Appliance
375 Tatted Pond Rd.
Waltham, MA 02454
Phone: (781) 895-4949 x236
  Fax: (781) 895-1195
Email: dford@orca.com

Mr. Charles Monia (P)
Nishan Systems Inc.
3850 North First St.
San Jose, CA 95134
Phone: (408) 519-3986
  Fax: (408) 435-8385
Email: cmonia@nishansystems.com

Mr. Joshua Tseng (A)
Nishan Systems Inc.
3850 North First Street
San Jose, CA 95134
Phone: (408) 519-3749
  Fax: (408) 435-8385
Email: jtseng@NishanSystems.com

Mr. Gregg Neely (AV)
NSTOR
10140 Mesa Rim Rd.
San Diego, CA 92121
Phone: (858) 453-9696
  Fax: (858) 453-9294
Email: greggn@nstor.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

Dr. Terence J. Nelson (P)
Panasonic Technologies, Inc
167 Maple St.
New Providence, NJ 07974
Phone: (908) 464-1652
  Fax: (908) 464-0149
Email: terry@tjnelson.com

Mr. Rudolf Vitti (A)
Panasonic Technologies, Inc
One Panasonic Way
Panazip 1E-6
Secaucus, NJ 07094
Phone: (201) 348-7064
  Fax: (201) 348-7807
Email: vittir@panasonic.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. William P. McFerrin (P)
Philips Electronics/CD Edge
841 Rocky Mtn Place
Longmont, CO 80501
Phone: (720) 320-0790
Fax:
Email: bill.mcferrin@cdedge.com

Mr. Frank Fang (AV)
Philips Semiconductors
811 E. Argues Ave.
Sunnyvale, CA 94088-3409
Phone: (408) 991-3348
Fax: (408) 991-2600
Email: frank.fang@philips.com

Mr. Charles Binford (P)
Pirus Networks
3450 N. Rock Rd., Suite 301
Wichita, KS 67226
Phone: (316) 315-0382 x222
Fax: (509) 756-4425
Email: charles.binford@pirus.com

Mr. Skip Jones (P)
QLogic Corp.
26600 Laguna Hills Dr.
Aliso Viejo, CA 92656
Phone: (949) 389-6368
Fax: (949) 389-6114
Email: skip.jones@qlogic.com

Mr. Richard Moore (A#)
QLogic Corp.
26600 Laguna Hills Dr.
Aliso Viejo, CA 92656
Phone: (949) 389-6232
Fax: (949) 389-6121
Email: richard.moore@qlogic.com

Mr. Dean Wallace (A)
QLogic Corp.
26600 Laguna Hills Dr.
Aliso Viejo, CA 92656
Phone: (949) 389-6480
Fax: (949) 389-6128
Email: dean.wallace@qlogic.com

Mr. Paul Entzel (P)
Quantum Corp.
4001 Discovery Dr.
Boulder, CO 80303
Phone: (720) 406-5782
Fax: (720) 406-5762
Email: paul.entzel@quantum.com

Mr. Patrick McGarrah (A)
Quantum Corp.

501 Sycamore Blvd.
Milpitas, CA 95035
Phone: (408) 944-4438
  Fax: (408) 944-4027
Email: pat.mcgarrah@quantum.com

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

Mr. Yau-Ting Mau (AV)
Roxio, Inc.
461 S. Milpitas Blvd.
Milpitas, CA 95035
Phone: (408) 957-6831
  Fax:
Email: yauting.mau@roxio.com

Mr. Yasuyuki Suemori (AV)
Sanyo
900 N Arlington Heights Rd.
Suite 300
Itasca, IL 60143
Phone: (630) 875-3513
  Fax:
Email: ysue@sanyosales.com

Mr. Ken-Ichi Kojima (AV)
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. Gerald Houlder (P)
Seagate Technology
Mailstop SHK231
1280 Disc Drive
Shakopee, MN 55379-1863
Phone: (952) 402-2869
  Fax: (952) 402-3471
Email: gerry_houlder@seagate.com

Mr. A. Bruce Manildi (A)
Seagate Technology
4585 Scotts Valley Dr.
Scotts Valley, CA 95067
Phone: (831) 439-7229
  Fax: (831) 438-8608
Email: bruce_manildi@seagate.com

Mr. Jon P. Baker (AV)
Seagate Technology
10323 W. Reno Ave.
Oklahoma City, OK 73116
Phone: (405) 324-3591
  Fax:
Email: jon_baker@seagate.com

Mr. Daniel F. Smith (AV)
Seagate Technology

4585 Scotts Valley Dr.
Scotts Valley, CA 95066-4544
Phone: (831) 439-7146
  Fax: (831) 439-7546
Email: daniel.f.smith@seagate.com

Mr. Van T. Ton (AV)
Seagate Technology, LLC
4585 Scotts Valley Dr.
Mailstop: SV15D1
Scotts Valley, CA 95066
Phone: (831) 439-7005
  Fax: (831) 439-7541
Email: Van.T.Ton@seagate.com

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

Mr. Joe A. Maciel (AV)
Sony Electronic
3300 Zanker Rd. SJ2E2
San Jose, CA 95134-1901
Phone: (408) 955-5547
  Fax:
Email: joe.maciel@am.sony.com

Mr. Dennis Pak (AV)
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 (AV)
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 (AV)
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. Dennis Appleyard (A)
Storage Technology Corp.
One StorageTek Dr.
Louisville, CO 80028
Phone: (303) 673-6685
  Fax:
Email: erich_oetting@stortek.com

Mr. Kenneth Moe (P)
Sun Microsystems, Inc.
7777 Gateway Blvd.
Mail Stop NWK16-211
Newark, CA 94560
Phone: (510) 936-2304
  Fax:
Email: kenneth.moe@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 (AV)
Temp Flex Cable, Inc.
11 Depot St.
S. Grafton, MA 01560
Phone: (508) 839-5987
  Fax: (508) 839-4128
Email: kplourde@templex.com

Mr. Paul D. Aloisi (P)
Texas Instruments
50 Phillipe Cote St.
Manchester, NH 03101
Phone: (603) 222-8687
  Fax: (603) 222-8700
Email: Paul_Aloisi@ti.com

Mr. Donald R. Getty (A)
Texas Instruments

Suite 220
4010 Moorpark Ave.
San Jose, CA 95117-1843
Phone: (408) 246-3100 x41
  Fax: (408) 246-3101
Email: donald_getty@ti.com

Mr. Jerry Rossman (AV)
The JPM Co.
155 North 15 St.
Lewisburg, PA 17837
Phone: (570) 524-8546
  Fax: (570) 524-5660
Email: jrossman@jpmco.com

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

Mr. Bob Gannon (AV)
The JPM Company
300 Carli Blvd.
Colchester, CT 06415
Phone: (860) 537-6800
  Fax: (509) 278-7661
Email: rgannon@jpmco.com

Ms. Valentina Grigorieva (AV)
The JPM Company
155 N. 15th Street
Lewisburg, PA 17837
Phone: (570) 524-8535
  Fax: (570) 524-5660
Email: vgrigoriev@jpmco.com

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

Mr. Fred Hooper (AV)
Thomas & Betts
5 Honeysuckle Dr.
Norwalk, CT 06851
Phone: (203) 840-0583
  Fax: (203) 840-0587
Email: fhooper@tycoelectronics.com

Ms. Tanya Huynh (AV)
Thomas & Betts Corp.
76 Fairbanks
Irvine, CA
Phone: (949) 707-2290
  Fax:
Email: tanya_Huynh@tycoelectronics.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. William C. Terrell (P)
Troika Networks, Inc.
2829 Townsgate Rd. Suite 200
Westlake, CA 91361
Phone: (805) 371-1377
  Fax: (805) 371-1344
Email: terrell@TroikaNetworks.com

Mr. Rick Casaly (A)
Troika Networks, Inc.
2829 Townsgate Rd. Suite 200
Westlake, CA 91361
Phone: (805) 367-2738
  Fax:
Email: rcasaly@troikanetworks.com

Mr. Charles Brill (P)
TycoElectronics
Mail Stop 128-051
PO Box Box 3608
Harrisburg, PA 17105-3608
Phone: (717) 986-6489
  Fax: (717) 592-6222
Email: cbrill@tycoelectronics.com

Mr. Tom J. Zola (A#)
TycoElectronics
Mail Stop 258-035
PO Box 3608
Harrisburg, PA 17105-3608
Phone: (717) 592-3141
  Fax: (717) 522-3588
Email: tjzola@tycoelectronics.com

Mr. Ron Mathews (AV)
UNISYS Corporation
MV201
25725 Jeronimo Road
Mission Viejo, CA 92691
Phone: (949) 380-5077
  Fax: (949) 380-5858
Email: ronald.mathews@unisys.com

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

Mr. Roger Cummings (P)
Veritas Software
400 International Parkway
Heathrow, FL 32746
Phone: (407) 531-7257
  Fax:
Email: roger.cummings@veritas.com

Mr. Ron Martin (A)
Veritas Software
400 International Parkway
Heathrow, FL 32746

Phone: (407) 531-7621
  Fax: (407) 531-7720
Email: ron.martin@veritas.com

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

Mr. Ben Chen (AV)
Wieson Electronic Co. Ltd.
Phone:
  Fax:
Email:

Mr. Doug Piper (P)
Woven Electronics
PO Box 189
Mauldin, SC 29662
Phone: (864) 967-1751
  Fax: (864) 963-1761
Email: doug.piper@wovenelectronics.com

Mr. Tom Browning (A)
Woven Electronics
1001 Old Sage Rd.
Simpsonville, SC 29681
Phone: (864) 967-1759
  Fax:
Email: tom.browning@wovenelectronics.com

Mr. E.J. Mondor (A)
Woven Electronics
PO Box 189
Mauldin, SC 29662
Phone: (864) 967-1739
  Fax: (864) 963-1761
Email: ej.mondor@wovenelectronics.com

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