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**Reply to:** Mark Overby

**To:** Membership of T13  
**From:** Mark Overby, Secretary of T13, and Dan Colegrove, Chairman of T13  
**Subject:** Minutes of 49th T13 Plenary Meeting at Bally's, Las Vegas, NV.  
October 19th to October 21st, 2004

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## **Results of the Meeting**

### **1 Opening remarks**

Dan Colegrove, the T13 Chair, called the meeting to order at 9:15 A.M. on Tuesday, October 19th, 2004. Dan Colegrove thanked Sumit Puri of Fujitsu who hosted this meeting.

As is customary, the people in attendance introduced themselves, and a copy of the attendance list was circulated. Copies of the agenda were made available to those in attendance.

The Chair briefly reviewed the meeting rules: T13 is a Technical Committee of INCITS and operates under INCITS rules. Anyone with interest in the work of the committee is free to attend and take part in discussions. However, motions and votes are limited to member organizations, one vote per member organization.

The Chair also noted that T13 operates under the INCITS antitrust guidelines. There should never be discussion of the following topics at any INCITS or an INCITS subgroup meeting:

- Any company's prices or pricing policies;
- Specific R&D, sales and marketing plans;
- Any company's confidential product, product development or production strategies;
- Whether certain suppliers or customers will be served;
- Prices paid to input sources; or
- Complaints about individual firms or other actions that might tend to hinder a competitor in any market.

Policies and Procedures and antitrust guidelines for INCITS are available at the web site at [www.incits.org](http://www.incits.org). T13 operates under these policies and procedures augmented by the T13 procedures at the T13 web site at [www.t13.org](http://www.t13.org).

### **2 Approval of agenda**

Larry Barras moved, Curtis Stevens seconded, that the agenda be approved. The motion passed with unanimous consent.

### **3 Membership and attendance**

The Chair reviewed the rules for membership and attendance:

#### **3.1 Membership**

An individual from an organization new to T13 must attend at least one T13 plenary meeting before requesting voting membership. After that meeting, the representative may request

membership from the T13 chair stating expertise and material interest in the scope of the committee and pay the required fees to INCITS. The time when membership becomes effective has just changed. Membership now becomes effective at the start of the next meeting the organization attends assuming the organization attends one of the next two meetings.

### **3.2 Fees**

Current INCITS memberships fees for Principal or additional Alternates are 800.00 USD. The First Alternate is free with a Principal membership.

Mailings of committee documents are available to any interested party after each plenary meeting. The cost for mailings for one year is 300.00 USD for mailing in the USA and 400.00 USD for mailing to a location outside of the USA.

Persons with questions or requests regarding membership fees and/or subscriptions for mailings should contact Parthenia Purnell, ITI Standards Operations, at [ppurnell@itic.org](mailto:ppurnell@itic.org).

The chair reviewed the current membership status of members according to INCITS. It was noted by multiple members that they had paid and had receipts for their payment, but were not reflected in the INCITS list. In addition, there were multiple errors in the primary and alternate designations.

### **3.3 Attendance**

In addition to payment of fees, there are also minimum attendance and participation requirements to maintain voting membership status on T13. A representative from a member organization must attend two of every three plenary meetings and vote on at least every other letter ballot. If a member organization fails to have a representative in attendance at two of the last three T13 plenary meetings or vote on every other letter ballot, they are warned that failing to attend the next T13 meeting or to vote on the next letter ballot will result in their voting membership being terminated.

Attendance at a working group meeting does not affect voting membership status in T13.

The T13 voting membership during the meeting was 21 organizations. The membership list is appended to this document.

The number of eligible voting members required for establishing a quorum was 7. 16 Member organizations were present at the start of the meeting, thus a quorum was present.

The following individuals attended:

Name	Company
Gardner, Phil	Absolute Software
Barras, Larry	Apple
Puri, Sumit	Fujitsu
Colegrove, Dan	Hitachi GST
Livaccari, Steve	IBM
Thompson, Tim	LSI Logic
Schaddeg, John	Samsung
Evans, Mark	Maxtor
Overby, Mark	NVIDIA
Obr, Nathan	Microsoft
Liu, Raymond	Silicon Image
Luksic, Mladen	Western Digital
Hatfield, Jim	Seagate
Hirata, Kenneth	Emulex
Stevens, Curtis	Western Digital
Hughes, Gordon	UC-SD
Dees, Brian	Intel
Maxwell, Conrad	NetCell
Zelenko, Karen	Phoenix Technologies
Masiewicz, John	Western Digital

## 4 Approval of the Minutes from the Previous T13 Plenary Meeting

As the previous minutes has not yet been approved by INCITS, no action was taken.

## 5 Document Distribution

The following documents were distributed either via hard copy, soft copy, or both:

Agenda and document directory

## 6 Review of Previous Action Items

The open action items list were reviewed under item 11

### 6.1 Review of Open Issues

1. Dan Colegrove to forward TLC to INCITS for processing. [Done]
2. Jim Hatfield to verify the front matter of TLC. [Done]
3. Dan to do 1572r2a letter ballot. [Done]
4. Jim to resend information about TCG reflector. [Done]
5. Jim to resend TCG meeting information. [Done]
6. Curtis Stevens to turn a new revision of SCT. [Done]
7. Curtis to turn a new revision of 1699D. [Done]
8. John Masiewicz to turn a new revision of 1697D. [Done]
9. Nathan Obr to bring a proposal to clarify the behavior as to what hosts shall expect and devices shall do when a command is not supported and for how to report unsupported commands (clarification) [Carryover]
10. Dan to find out if documents should have a –N (for national standard) on all pages containing the document number. [Carryover]
11. Dan to report back about establishing liaison for the MMC (Multimedia Card). [Not yet heard back from MMC. Carryover]
12. Mark Overby and Jithendra Bethur to coordinate on PCI-E extension for DPTE table. [Overcome by events. Item to be dropped]

## 7 Old Business

### 7.1 ATA/ATAPI-7 Project 1532D

#### 7.1.1 INCITS Status

First public review completed, one public comment resolved. Document currently undergoing ANSI editorial review and INCITS management review. John Masiewicz is already working on the ANSI comments and reviewed the editorial comments with the attendees. John reviewed all

of the editorial comments with the attendance and resolved the editor comments. The comments and editors comments will be posted to the T13 website under document e04151r0.

## **7.2 Time Limited Commands Project Proposal [Hatfield]**

### **7.2.1 INCITS Status**

Forwarded to INCITS and is undergoing management review and first public review will be done in approximately 90 days. Public review is announced through the normal INCITS process.

## **7.3 ATA/ATAPI-8 Projects**

### **7.3.1 AT Attachment-8 – Architecture Model**

Jim Hatfield reported that he has nothing to report as he is unable to work on this document currently and is offering it back up to the group if someone else wished to take this on. Mark Evans reported that he might be able to take this on, but was unsure.

#### **7.3.1.1 Architecture Model Discussion and Diagram [Hatfield]**

No action to report.

### **7.3.2 AT Attachment-8 – ATA/ATAPI Command Set (ATA8-ACS)**

Dan Colegrove reminded the group that the proposal cutoff is February for new proposals.

Curtis Stevens reviewed the changes to the command set document in revision 1b. Curtis stated that the protocols for each command would be documented with a brief paragraph and links to definitions of the protocols at the transport layer (serial or parallel). Curtis also indicated that we need rigorous definitions for the protocols in each transport document. There are placeholders in the ACS document and Jim Hatfield pointed out that this might make more sense to have in the architecture document.

Curtis reviewed the way the commands are formatted in the document. Input was received from multiple parties that consolidating tables that are common to multiple commands should be consolidated into one section elsewhere in the document. In addition, comments were made to help improve the clarity of each section by labeling the input data and output data as separate clauses in the command description. A request was also made to make sure that the feature set that a command belongs to was made a separate clause before the command description.

Curtis recommended that we allow visio to do state diagrams. There general consensus was that was acceptable.

#### **7.3.2.1 Proposed Command Format (e04139r1-Command\_Format\_Example)**

Dan Colegrove stated that this agenda item was held over in error and will not be carried forward.

### **7.3.2.2 HPA State Diagram Corrections [Zelenko]**

Karen Zelenko reported that he does not have any material to present and this meeting but has received feedback from other parties and is incorporating that feedback. This item will be carried over to future meetings.

### **7.3.2.3 Smart Table Settings / Single Smart Table Proposal [Stevens] (e04143r0)**

Curtis Stevens has changed the tables so that there is one table for the commands. The one open item was to determine if the two different commands (SMART LOG and READ/WRITE LOG EXT) would reference the same table. There was general agreement that this should be case. Curtis Stevens, Jim Hatfield seconded, that the tables be combined as described in e04143r0. The motion passed with 14 ayes, 0 nays, and 1 abstention.

### **7.3.2.4 Assignments for Trusted Computing Group [Hatfield]**

Jim Hatfield reported that in general no one in TCG cared about having a PIO command, however there are operating systems and drivers that do not support DMA pass-through. Jim reported that because of this 4 opcodes are now requested to cover PIO and DMA. T10 will document the data stream in a SPC-4 (SCSI Primary Commands). Curtis Stevens suggested that if these opcodes are added, that a sunset clause be added to ensure that the opcode usage can be tracked and if not used that they could be reclaimed. Ken Hirata stated that the opcodes are being reserved on the belief that TCG will publish the data stream format for the commands. Ken stated that he believes that T13 should reclaim the commands if the data stream format were not published. Jim Hatfield questioned what would this group consider “delivered” for the data stream format. Mark Evans stated that he would consider it as being completed and accepted for inclusion in a standard. Larry Barras asked if this needs to be decided right now. Jim stated that currently TCG is using vendor-unique op codes and is trying to be upfront about the opcodes. Jim Hatfield moved, Sumit Puri seconded, that 4 opcodes be reserved for the purpose of the proposal e04128r3. During the discussion on the motion, Curtis asked that the motion be amended to reserve the opcodes and they be added to this proposal and the proposal continue on the agenda for further development. The mover and seconder agreed. The motion passed with 13 ayes, 0 nays, and 2 abstentions.

### **7.3.2.5 Write Read Verify Proposal [Puri]**

Sumit Puri presented the updated proposal for write read verify commands. The outstanding issue was if write caching is enabled if it was ok to report good status if the data is in the cache and not yet committed to disk. The proposal indicates that it is ok, but if the data failed when written to the media then the next command would be aborted with an error. It is indicated that the drive will lock up and can only be cleared by a power cycle of the drive. Steve Livaccari asked when the write is actually be verified. Sumit stated that the verification could be delayed until data was forced to be evicted from the cache. Curtis Stevens was concerned that this proposal was making the operations more complex to accomplish the goals of this command. There were concerns raised that there should be a strong definition of what the retry policy is if the command does not complete. Sumit agreed to revise the document to include that device fault was the appropriate error status bit would be used and a statement that the device shall try to log errors if possible.

### **7.3.2.6 Download Microcode Enhancements [Livaccari]**

Dan Colegrove stated that there have been no changes to the proposal. Curtis Stevens stated that he may want to bring a proposal in parallel to this proposal. Curtis stated that he plans on having a proposal for the next meeting. Steve Livaccari agreed to carry this proposal to the next meeting to work with Curtis's proposal.

### **7.3.3 AT Attachment-8 – Parallel Transport (ATA8-PT)**

Mark Overby stated that he will bring a draft to the next meeting.

### **7.3.4 AT Attachment-8 – Serial Transport (ATA8-ST)**

John Masiewicz reviewed the first draft of the serial transport document (r0). John is taking some material from Rob Elliot from the SAS documents to clean up the serial transport document and make the content better. John is in the process of doing that now. John also reviewed the changes to the glossary made by merging with the SAS glossary and removing all SCSI and PATA specific references. John noted that the capitalization policy reversed from ATA/ATAPI-7, in previous standards defined terms were capitalized, whereas now the capitalization is subject to normal English usage rules.

Mark Evans moved, Tim Thompson seconded, that ordered lists for standards in development and future standards be 1, 2, 3 and unordered lists be a, b, c. The motion passed with 9 ayes, 1 nay, and 0 abstentions. Jim Hatfield stated that he was opposed because he was concerned that this could cause confusion.

Jim suggested that we add the term from T10 of restricted to indicate bits, bytes, or fields that are used for other specifications and standards. Jim agreed to bring a proposal to do this.

Mark Overby suggested that we consider converting our state diagrams to UML state diagrams. Mark Evans stated that the T10 committee was considering UML as well. Mark Overby agreed to bring a document showing example state diagrams that have been converted to UML. (Document number e04131r0).

John noted that because of the large number of revisions change bars were not possible for this revision of the document.

#### **7.3.4.1 Soft settings across COMRESET [Masiewicz / Stevens]**

This item was removed at the last meeting and was carried forward in error.

### **7.3.5 AT Attachment-8 – Infrastructure Components (ATA8-IC)**

#### **7.3.5.1 Project Proposal Review**

Larry Barras stated that he will not bringing a proposal for this forward. Mark Overby stated that it would be good to have some sort of document that standardizes such items and bridges and other components.

#### **7.3.5.2 Project Schedule or Cancel**

Dan Colegrove stated that he will remove this from future agendas.

## **7.4 SMART Command Transport (SCT) Technical Report [Stevens]**

### **7.4.1 SCT BIST Proposal [Stevens] (e04148r0)**

Curtis Stevens and John Masiewicz presented a proposal about using an SCT command to initiate a BIST FIS from the device to the host. In addition to initiating the BIST FIS, the command allows the device to self-terminate the BIST using standard COMINIT sequencing. Brian Dees asked if there was anything in this proposal that would require changes to the SATA specifications. Curtis answered that this was not the case. There was a substantial discussion about the need for a way to initiate a BIST from a device and how the best way to do this. John and Curtis agreed that they would bring back an enhancement to this proposal and to carry this agenda item forward.

### **7.4.2 Review of Draft**

Curtis Stevens led a change bar review of draft 2a of the SCT technical report. Curtis then asked for any further comments from attendees to incorporate into a new draft of the SCT technical report. Curtis incorporated the comments into revision 2b. Curtis Stevens made a motion, Mark Overby seconding, that revision 2b undergoes a letter ballot for forwarding to INCITS. The motion passed with 14 ayes, 1 nay, and 0 abstentions.

## **7.5 EDD-3 (1572D) [Stevens]**

### **7.5.1 Letter Ballot Results / Comment Resolution**

Dan Colegrove stated that EDD-3 passed letter ballot with 18 yes, 1 no, 0 abstains, and 2 ballots not returned.

Curtis Stevens led a resolution of the letter ballot comments and will publish the resolution as document e04150r0-EDD\_Letter\_Ballot\_Comment\_Resolution. Curtis Stevens will publish the updated document as 1572D revision 3.

### **7.5.2 Vote to accept comment resolution**

Curtis Stevens moved, Mark Evans seconded, that e01450r0 be accepted as the letter ballot comment resolution. The motion passed with 14 ayes, 0 nays, and 0 abstentions.

## **7.6 A/V Technical Report [Colegrove]**

Nothing new to report.

## **7.7 PARTIES-2 Project Status [Zelenko]**

### **7.7.1 Proceed or Cancel?**

Karen Zelenko reported that his current opinion is that the project should be cancelled in its current definition. He reported that in the future they may want to bring a new proposal for an enhancement to the original project.

Karen Zelenko moved, Curtis Stevens seconded, to cancel the PARTIES-2 project (1641D). A roll call vote was held.

Absolute Software: Not Present  
 Apple: Yes  
 Emulex: Yes  
 Fujitsu: Not Present  
 Hitachi GST: Yes  
 IBM: Yes  
 Intel: Yes  
 LSI Logic: Yes  
 Maxtor: Yes  
 Microsoft: Yes  
 NetCell: Yes  
 NVIDIA: Abstain  
 Pacific Digital: Not Present  
 Phoenix Technologies: Yes  
 QLogic: Not Present  
 Samsung: Yes  
 Seagate: Yes  
 Silicon Image: Yes  
 ST Microelectronics: Not Present  
 Toshiba: Not Present  
 Western Digital: Yes

The motion passed the 2/3 criteria with 14 yes, 0 nays, and 1 abstention.

## **7.8 T13 reflector, FTP, and web site setup**

Mark Evans commented that there is a perl script available that can automatically number acrobat comments that would be useful for letter ballots. He will make the script available through the reflector.

Dan Colegrove is currently updating all documents to incorporate long file names. Also the project links point to the most current revisions, with all older revisions still available. Dan is creating a new directory to store down level drafts for older revisions of project documents that will be available via FTP only. Old projects do not currently have long file names. File names should start with a lower case e or d depending on the document type, followed by the document number and revision (lower case r), followed by the document name using underscores instead of spaces.

## **8 New Business**

### **8.1 Secure Erase Freeze Lock Proposal (e04147r0)**

Gordon Hughes of UCSD brought a proposal to modify the behavior of secure erase commands which are currently blocked if the freeze lock state is current in effect. Gordon presented a white

paper that also discusses the behavior and limitations of secure erase. Nathan Obr questioned why the BIOS's issue a freeze lock command. Curtis Stevens responded that the freeze lock was originally designed to prevent the random password attack on the drive (an attack that the drive password gets attacked to a random value). A discussion was held on what level of security a single write pass gives. Gordon stated that it gives equivalent level of security of DOD-5220. Phil Gardner stated that he believed that this is a feature that needs to be driven by the final customer (i.e. OEM). Dan Colegrove stated that he believes that this group could help bring focus to the usage model for a revised model of secure erase. Phil pointed out that there are potential solutions to this problem by modifying the system BIOS.

### **8.2 Corrections to Serial ATA signature [Hatfield]**

Jim Hatfield noticed that in ATA-7 the signatures reserved for serial-ATA were split into packet and non-packet devices. He stated that it was never the intention for these signatures to be split into packet and non-packet devices. Dan Colegrove stated that this should be considered for an erratum to ATA-7. Jim stated that this would be carried over to the next meeting for consideration.

### **8.3 Self-test polling time [Hatfield]**

Jim Hatfield stated that for the SMART extended self-test, the value reported for bytes 372-374 is treated as a maximum allowed time for the test to complete. Because drives have become larger and more time is needed, this value may not be sufficient to indicate a maximum time for a poll to complete. Mark Evans stated a concern with the proposal that it would change the meaning of the low byte so that applications could sense a wrong value if they did not understand the new value. Mark suggested that if the value of the low byte (existing values) was 255, then the user should examine the high byte to determine the time. Jim agreed that this would be an acceptable change for the time. In addition to remove the short and conveyance tests and just make this applicable to the extended test. Jim stated he would bring back a new revision at the next meeting.

### **8.4 Device Initiated Power Management [Masiewicz]**

A general review of the PHY power management states for serial ATA was covered. The inability to transition directly from partial to slumber was pointed out. IDENTIFY DEVICE bits were discussed which indicates if the device supports power management to indicate if the device supports initiated power management. This presentation discusses the ability for the device to initiate power management states without introducing new commands or serial transport features. The device would implement automatic power management using timers for command status and partial / slumber times to determine when to initiate the power management. Sumit Puri and Dan Colegrove both stated that this should not define timers that the device must implement. The discussion continue to indicate that the device, if using timers, could start and stop a partial timer based on Tx or Rx traffic. If the timer expires, it goes to partial, then a slumber timer starts. If the slumber timer expires, then the interface goes to active and requests slumber once in active.

## **8.5 Items from the reflector**

### **8.5.1 Detecting PATA device behind SATA bridge**

Jim Hatfield brought up an issue involving how to detect a PATA device behind a SATA bridge. The committee discussed this and decided that there was not a sufficient solution with today's technology. A discussion also ensued on what could be done in the future. Mark Overby agreed to bring a proposal to identify SATA packet and hard drives separately.

### **8.5.2 ATA Command Overlap and Queing [Stevens]**

Curtis Stevens discussed the use (or lack thereof) of overlapped commands for packet device. Curtis and Jim Hatfield stated that, to their knowledge, no devices were using this command set. Dan Colegrove stated he thought the best way of doing this was to create a proposal and make sure it is circulated on the reflector as well as in the meeting. Curtis stated that he will bring a proposal to the next meeting as time permits.

### **8.5.3 ATA spec issue with Execute Device Diagnostics**

A reflector issue came up with EDD and the state diagrams. The problem is one of the HED2 transitions loops on itself when BSY1. Mark Evans pointed out that the text for the HED2 transition says HED1 when it was HED2. After discussion was held there was a consensus that the BSY loop is appropriate because even if the device raises an interrupt that the host must still wait for BSY to be clear in order to return to the host idle state.

### **8.5.4 Could Model Number field start with manufacturer ID's [Elliot]**

A discussion was held about if there was a need to have an assigned manufacturer ID field in IDENTIFY DATA for each manufacturer. This need for this was to accommodate SAT in their need to be able to generate INQUIRY data. Dan Colegrove stated that he would like to see a more formal proposal to proceed.

## **8.6 INCITS Rule Changes**

Jim Hatfield reviewed the INCITS RD-2 rule changes, but stated that the primary rule changes dealt with disbanding and that there were no relevant changes to the operation of the T13 organization.

## **9 Liaison Reports**

### **9.1 T10**

Dan Colegrove has received a liaison report from T10 but has not posted it yet.

#### **9.1.1 SCSI to ATA Mapping Study Group**

The SAT working group meetings immediately follow the T13 meetings.

### **9.2 Trusted Computing**

TCG was discussed previously as part of the command reservation.

### **9.3 SFF**

SFF is working on a latched SAS connector, but Dan Colegrove believed that there was no impact on SATA. There is also work on 1" or less form factors, but this may or may not impact T13 activities.

### **9.4 IDEMA**

IDEMA is continuing on 4k sector work. The IDEMA A/V committee met and continues work on benchmark software for A/V.

### **9.5 Compact Flash Association**

Meets in two weeks. No news to report.

### **9.6 Serial ATA II**

Dan Colegrove will post the letter from Knut Grimsrud of SATA-IO to cover release of copyright for 1.0a material for future projects. John Masiewicz stated that 1-45 are already in ATA-7 and most of the ones after that are in the text as they were developed in this organization. However, there may be a few errata that need incorporation.

### **9.7 MMC (Multi Media Card)**

Dan Colegrove is still awaiting a response from the MMC group about establishing a liaison.

## **10 Call for Patents**

The Chair explained the patent policy. A document is available from ANSI, "Procedures for the Development and Coordination of American National Standards", at no charge. This document is also on the INCITS web site at [ftp://www.incits.org/help/ansi\\_sdo.html](ftp://www.incits.org/help/ansi_sdo.html). Section 1.2.11 contains the ANSI patent policy. Amy Marasco manages patent issues for ANSI and can be contacted at [amarasco@ansi.org](mailto:amarasco@ansi.org) or 212-642-4954.

The Chair then called for patents and/or patent applications that may be necessary to comply with the requirements in T13 standards, draft standards, technical reports, or draft technical reports.

Mark Evans stated that there was a Maxtor patent(s) that applied to ATA-5 as well that should have been released for ATA-7. Mark Evans clarified that this was from Quantum and was unsure if a separate letter was needed from Maxtor. Dan Colegrove reviewed the document and the patent was made available to ATA-5 and subsequent standards.

## **11 Review of Action Items**

1. Dan Colegrove to draft an ATA-7 erratum for the device signature issues.
2. Dan Colegrove to query INCITS about the procedure for canceling a project.
3. Dan Colegrove to notify INCITS the intention to cancel PARTIES-2.

4. Mark Overby to bring example document of state diagram conversion to UML
5. Jim Hatfield to bring proposal for the addition of the term restricted.
6. Mark Evans will research if a separate letter is needed from Maxtor for a Quantum patent related to UDMA that was released for ATA-5 and subsequent projects.
7. Jim Hatfield to create document e04153r0 to propose an annex documenting when various features/opcodes/bits became obsolete or reserved.
8. Nathan Obr to bring a proposal to clarify the behavior as to what hosts shall expect and devices shall do when a command is not supported and for how to report unsupported commands (clarification) [Carryover]
9. Dan Colegrove to find out if documents should have a –N (for national standard) on all pages containing the document number. [Carryover]
10. Dan Colegrove to report back about establishing liaison for the MMC (Multimedia Card). [Not yet heard back from MMC. Carryover]

## 12 Schedule

### 12.1 Back to 2.5 days to accommodate to SATA to ATA WG

Dan Colegrove stated that we will remain at 2.5 days to accommodate the SAT working group.

### 12.2 Authorization of Ad Hoc Working Groups

No ad-hoc meetings were authorized.

### 12.3 Long term meeting schedule

The meeting dates, locations, hosts, and contacts were reviewed through CY2005 (included below).

#### 12.3.1 Hosting Volunteers

<b>CY 2004 Dates</b>	<b>Location</b>	<b>Host</b>	<b>Contact</b>
December 14-16, 2004	Las Vegas, NV	Hitachi Global	Dan Colegrove
<b>CY 2005 Dates</b>	<b>Location</b>	<b>Host</b>	<b>Contact</b>
February 22-24, 2005	Santa Clara, CA	NVIDIA	Mark Overby
April 19-21, 2005	Longmont, CO	Seagate	Jim Hatfield
June 21-23, 2005	Orange County, CA	Western Digital	John Masiewicz.
August 23-25, 2005	Longmont, CO	Maxtor	Mark Jackson
October 18-20, 2005	Las Vegas, NV	Fujitsu	Sumit Puri
December 13-15, 2005	Las Vegas, NV	Hitachi Global	Dan Colegrove
NOTE – Meetings are scheduled for three days.			

## 13 Adjournment

Mark Overby moved, Curtis Stevens seconded, that the meeting be adjourned at 1145 21 October 21, 2004. The motion passed with unanimous consent.

**T13 Members as of October 19, 2004:**

<b>Company</b>	<b>Principal</b>	<b>Alternate</b>
Absolute Software	Phil Gardner Phil at absolute dot com 604 730-9851	Rob Schram
Apple Computer	Larry Barras barras at apple dot com 408 974-3220	Randy Sharp sharp.r at apple dot com 408-974-5024
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Fujitsu	Sumit Puri spuri at fcpa.fujitsu dot com 408 829-5252	Mike Chenery
Hitachi GST	Dan Colegrove Daniel.colegrove at hitachigst dot com 702 614-6119	Frank Chu Frank.chu at hitachigst dot com 408 323-7221
IBM	Steve Livaccari Livaccari at us.ibm dot com 919 543-7393	Jeff Hobbet
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Maxtor	Mark Evans mark.jackson at Maxtor dot com 303 702-4530	Ben Chang
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nVidia	Mark Overby Moverby at nvidia dot com 425 417-9412	Scott Pritchett
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<b>Company</b>	<b>Principal</b>	<b>Alternate</b>
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