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Date: April 22, 2003
Reply to: Dan Colegrove

To: Membership of T13
From: Curtis Stevens, Secretary of T13, and Dan Colegrove, Acting Chairman of T13
Subject: Minutes of 40th T13 Plenary Meeting at Irvine, CA.
April 22 through 24, 2003

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Results of the Meeting

1 Opening remarks

Dan Colegrove, the acting T13 Chair, called the meeting to order at 9:00 A.M. on Tuesday, April 22, 2003. Dan thanked Jim Hatfield and Seagate for hosting the 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:

- ~~/s/~~ Any company's prices or pricing policies;
- ~~/s/~~ Specific R&D, sales and marketing plans;
- ~~/s/~~ Any company's confidential product, product development or production strategies;
- ~~/s/~~ Whether certain suppliers or customers will be served;
- ~~/s/~~ Prices paid to input sources; or
- ~~/s/~~ 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. T13 operates under these policies and procedures augmented by the T13 procedures at the T13 web site at www.t13.org.

Dan Colegrove announced the farewell dinner for Pete McLean, the retiring chair. Jim Hatfield is making the arrangements. 14 people indicated that they can attend.

2 Approval of agenda

Marc Noblitt moved and Mike Eschman seconded that the agenda be approved as reflected in these minutes. The motion was approved unanimously.

3 Membership and attendance

The Chair reviewed the rules for membership and attendance:

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.

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.

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 19 organizations. There were 19 companies present.

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

The following individuals attended:

Name	Company	E-Mail
Barras, Larry	Apple Computer	barras@apple.com
Breher, Joe	Lingua Data	joe@q-music.com
Carlson, Craig	Qlogic	craig.carlson@qlogic.com
Carr, Larrie	PMC-Sierra	carr@pmc-sierra.com
Davis, Bob	Network Appliance	bob@netapp.com
Eschmann	Intel	michael.k.eschmann@intel.com
Gardner, Phil	Absolute Software	phil@absolut.com
Grimsrud, Knut	Intel	knut.s.grimsrud@intel.com
Hatfield, Jim	Seagate	james.c.hatfield@seagate.com
Hirata, Kenneth	Vixel	ken.hirata@vixel.com
Jackson, Mark	Maxtor	mark_jackson@maxtor.com
Kataria, Mukesh	Phoenix	mukesh_kataria@phoenix.com
Krantz, Arie	Qlogic	l_krantz@qlc.com
Landis, Hale	Consultant	hlandis@ata-atapi.com
Livaccari, Steve	IBM	livaccari@us.ibm.com
Lott, Glenn	ST Microelectronics	glenn.lott@st.com
Masiewicz, John	Western Digital	john.masiewicz@wdc.com
Noblitt, Marc	Seagate	marc.noblitt@seagate.com
Obr, Nathan	Microsoft	natobr@microsoft.com
Puri, Sumit	Fujitsu	spuri@fcpa.fujitsu.com
Rueckert, Ronald	Iomega	rueckert@iomega.com
Stevens, Curtis	Pacific Digital Corporation	cstevens@pacificdigital.com
Suzuki, Hiroshi	Toshiba	hiroshi.Suzuki@tais.toshiba.co
Thompson, Tim	LSI Logic	tim.thompson@lsil.com

4 Approval of the minutes from the previous T13 plenary meeting (e03101r0)

Curtis Stevens moved and John Mascewicz seconded that the minutes of the previous meeting, e03101r0, be approved as posted. The motion was approved unanimously.

5 Document distribution

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

Agenda and document directory

1532D Volume 3

D1612r0 (only 2 pages) Outline

6 Review of previous action items

1. Steven Fairchild to bring in a proposal for how to describe tracking and non-tracking implementations and how to organize the description of elasticity buffers. – Carry Over
2. Knut Grimsrud will bring in a list of the FIS type fields that need to be reserved for SATA II - Completed
3. Pete McLean will create a new revision (2a) of d1532v3 - Completed
4. Jim Hatfield agreed to print copies of the updated volume 3 - Completed
5. The Chair will recommend to INCITS that NCITS 316-1998 be withdrawn - Completed
6. The Chair will recommend to INCITS that NCITS 317-1998 be reaffirmed - Completed
7. Mukesh to come forward with a document for inclusion into ATA/ATAPI-7 that better defines how the HPA is manipulated – Carry Over
8. The Chair will forward project proposal e02148r2 to INCITS for processing - Completed
9. The Chair will inform INCITS and provide liaison reports that indicate the name of T13 is changing to ATA Storage Interface - Completed
10. Steve Fairchild will bring in a list of features that need to be added to DCO for ATA/ATAPI-7 – Carry Over
11. Pete McLean will notify Knute Grimsrud of the WG that was approved for 4-5 March - Completed
12. Curtis Stevens to turn a revision on WRITE WRONG (e02126) – Completed.
13. Pete McLean to create a text version of the table of contents (e03110r0) for volume 3 - Completed
14. Curtis Stevens to post a notice to the reflector on information for the 4-5 March WG - Completed
15. Curtis Stevens to turn a new revision of EDD-3 – Carry Over
16. Dan Colegrove to turn a new revision of Larger Physical Sector Size - Completed
17. Curtis Stevens to submit a project proposal for an extended cable length technical report - Withdrawn
18. Mukesh Kataria to create a project proposal for a follow-on to PARTIES-2 – Completed

7 Review of Open Issues

1. Should First Party DMA be removed from ATA/ATAPI-7
2. Should DMA Terminate be removed from ATA/ATAPI-7
3. Should DMA Setup be removed from ATA/ATAPI-7
4. Should clause 19 be kept together or broken up and error handling distributed to the appropriate sections
5. Should Annex J be kept or removed?
6. Should some of the host-side state transition diagrams be moved or duplicated into volume 1 or 3.

7. Should the mechanical drive drawings remain in volume 2 or should they be moved or duplicated elsewhere.
8. Do we include references to SFF-8070i in the normative references.
9. Cross references in common areas such as the glossary will have broken links using the current notation.

8 Old business

1394 to AT Attachment – Tailgate (ANSI NCITS 316-1998) Withdrawl Status

No status to report

ATA/ATAPI-4 (ANSI NCITS 317-1998) reaffirmation status

No status to report

ATA/ATAPI Host Adapter Standard project 1510D (ANSI INCITS 370-200x) Status

Curtis Stevens reported that there were no public review comments with the exception of the ANSI editor who had a couple of questions. The questions were addressed and the document is forwarded for publishing.

ATA/ATAPI-7 project 1532D

8.1.1 Larger logical sector size (e02132r3) [Colegrove]

Dan reviewed the latest revision. Some drives will not have a performance penalty if you do unaligned writes when there is a physical sector size that is a multiple of the logical sector size. There was a bit added to indicate that there was a performance penalty for performing read-update-write.

There were questions about the usefulness of the new bit. Old system would not know to read the bit. Updated systems that know about the bit would also be ready to do 4k aligned operation.

There was also an issue with device manufacturers reporting that their drives can incur a performance penalty.

Dan agreed to remove the bit.

The proposal also includes the ability to report long logical sectors. Changes were incorporated to incorporate a 32 bit value instead of a 16 bit value to indicate the sector size.

8.1.2 WRITE WRONG (e02126r0) [Stevens]

There was considerable discussion over the logging capability. The command currently defines a bit that indicates if the error gets recorded in the logs. The issue is that there is no way to tell the difference between wronged sectors and actual failures. A write wrong log was proposed. This would keep a

permanent record of write wrong commands. There was also a write correct proposed to record that a wronged sector was returned to active use.

In the end, everyone agreed that they wanted to do further research on how there read error log works and how SCSI implements this capability. No new proposal will be created.

8.1.3 Updating Device Configuration Overlay [Fairchild]

Dan proposed that words 8 and 9 of DCO be reserved for future serial ATA use.

The following new capabilities need to be considered for adding to DCO

1. Write wrong
2. A/V command sets
3. Selective self-test
4. Conveyance self-test
5. World Wide Name
6. ISO-7779 Value
7. UDMA-133
8. FUA (Forced Unit Access)

There was no concrete proposal for this capability

8.1.4 Volume 3 review

8.1.4.1 Open Issues

8.1.4.1.1 Should First Party DMA be removed from ATA/ATAPI-7

No (see SATA liaison report)

8.1.4.1.2 Should DMA Terminate be removed from ATA/ATAPI-7

Still Open. Discussion was should this be documented as doing nothing and incorporated into the state diagrams as such, or should it be removed entirely. If the primitive is defined it would then be subject to interpretation and there would be implementation requirements for it.

8.1.4.1.3 Should clause 19 be kept together or broken up and error handling distributed to the appropriate sections?

The group agreed that it should be kept together. There was an issue with this section being normative when error handling is actually specified in the state transition diagrams. Jim Hatfield suggested that the section be moved to the front of the document and be renamed as an Overview section. Straw polls: 15 people wanted it together, 1 person wanted to break it up. Straw Poll: 8 people want it to be informative, 5 people wanted it normative. Straw Poll: 6 people wanted to move section 19 forward, 10 people like it where it is.

8.1.4.1.4 Should Annex J be kept or removed?

There was discussion on keeping or removing the section. One solution is to move Annex J to a technical report. Another solution is to add some flow charts to make it clearer. In earlier discussions there were questions about the accuracy of this annex. The group decided to leave this where it is for now.

8.1.4.1.5 Should some of the host-side state transition diagrams be moved or duplicated into volume 1 or 3.

Dan pointed out that the host-side state diagrams are the same today, but serial is continuing to evolve while parallel is not. This will eventually lead to different diagrams in the future. Jim Hatfield agreed to come forward with a proposal (e03115r0) for which diagrams to move between volumes.

8.1.4.1.6 Should the mechanical drive drawings remain in volume 2 or should they be moved or duplicated elsewhere.

Generic form factors should be moved to volume 1 from volume 2. Volume 3 has connector placement information that will remain in volume 3. For example, Figure 19 on page 45 of volume 2 is the generic 3.5 inch drawing, see section 7.4.

8.1.4.1.7 Do we include references to SFF-8070i in the normative references?

The group agreed that SFF-8070i should become a normative reference.

8.1.4.1.8 Cross-references in common areas such as the glossary will have broken links using the current notation.

No action.

8.1.4.2 Volume 3 document review

John Masiewicz brought his version of the document with his proposed changes. Due to the volume of changes, the document was given #e03110 and will be used for the volume 3 document review. We reviewed sections 1-13 on the second day (Wednesday). We stopped at 14.5.6.1

8.1.5 Volume 1 and 2 change bar review

Carry Over

8.1.6 ATA/ATAPI-7 schedule review

Schedule Item	Original	Prior	Proposed
Project proposal	Aug-01	Aug-01	Aug-01
Initial draft	Dec-01	Dec-01	Dec-01
Proposal cut-off	Jun-02	Jun-02	Jun-02
Stabilized draft	Dec-02	Dec-02	Aug-03
Letter ballot	Apr-03	Apr-03	Dec-03
Forward to INCITS	Jun-03	Jun-03	Apr-04

The introduction of SATA into ATA/ATAPI-7 has changed the schedule for creating a Stabilized Draft, Letter Ballot and Forwarding to INCITS. There were no objections to the changes made in the proposed column.

EDD-3 project 1572D [Stevens]

Carry Over

A/V Technical Report project proposal status (e02148r2) [Colegrove]

Carry Over

PARTIES-2 e03107r0 [Kataria]

The proposal was reviewed and minor editorial changes were made.

Sumit Puri motioned and Mukesh Kataria that the proposal be accepted as modified and forwarded to INCITS for processing. Motioned passed 17-0-2

IDEMA Japan consensus on Time Limited Read/write (e03108r0) [Fuchigami]

Mr. Fuchigami did a presentation comparing AV Lite with AV Stream command set. Mr. Fuchigami is making a case to remove AV Lite from ATA/ATAPI-7. IDEMA believes that having 2 command sets causes confusion. IDEMA also believes that AV Lite is inadequate for current applications. IDEMA's has shown that AV Streaming provides the same capabilities as AV Lite, but AV Streaming also ads several capabilities associated with Stream ID's that are not addressed by AV Lite

Hiroshi Suzuki moved and John Masiewicz seconded that AV Lite be removed from ATA/ATAPI-7. Discussion followed the motion. There was a debate over the value of AV Lite. Some people felt that if nobody was requiring this now that it should not be added to the standard. Others felt that if it is a shipping feature that it should be kept. Seagate expressed that they had 3 paying customers that have been using this and that their customers wanted a second source. Others expressed concern that there are no optional features and that this would add a new requirement to their drives and test labs. Seagate also said that they have no customer demand for AV Streaming, they only have customers for AV Lite. The point was made that nobody was purchasing drives with AV Streaming and that this should probably be removed from ATA/ATAPI-7 as well. One suggestion was made that the name was the main issue and that separating the capability from the AV section might be a compromise. The question was called. Both a roll-call vote and a letter ballot were requested. Dan chose to make this a roll call vote. Motion failed: 4-6-6-5

Company	Voter	Yes	No	Abstain	Not Present
Absolute Software	Phil Gardner		X		
Adaptec					X
Apple	Larry Barras		X		
Fujitsu	Sumit Puri	X			
Hitachi Global Storage	Dan Colegrove	X			
Hitachi					X
IBM	Steve Livaccari			X	
Intel	Michael Eschmann		X		
LSI Logic	Tim Thompson		X		
Maxtor	Mark Jackson		X		
Microsoft	Nathan Obr			X	
Network Appliance	Bob Davis			X	
Pacific Digital	Curtis E. Stevens			X	
Phoenix Technologies					X
Qlogic	Arie Krantz			X	
Seagate	Marc Noblitt		X		
Sierra Logic					X
ST Microelectronics	Glenn Lott			X	
Toshiba	Hiroshi Suzuki	X			
Vixel					X

Western Digital	John Masiewicz	X			
Totals:		4	6	6	5

Sumit Puri moved and LSI seconded that the name of the AV Lite feature name be changed.

Curtis Stevens offered a friendly amendment to change the name to Time Limited Read/Write.

The motion now reads: Sumit Puri moved and LSI seconded that the name of the AV Lite feature name be changed to Time Limited Read/Write

Motion Passed 13-0-3.

Jim Hatfield asked to bring in a proposal for clarifications to Time Limited Read/Write as E03117r0

T13 Reflector, FTP, Web Site Setup, and Mailings

Curtis Stevens will now be helping to maintain the WEB site with Dan Colegrove. Everyone who would like a document posted should E-Mail it to both Dan & Curtis.

There was discussion once again on the use of conference phones for allowing people to attend the meeting. There was a meeting delay on 23-Apr because the conference line was not working. We have been allowing liaison reports via conference phone for the last 2 meetings. There was a proposal that people be allowed to dial in for listening. Some people felt that this would also be disruptive. Since there is no approved policy by our committee the debate rages on. Dan is going to bring forward a proposed policy on using the phone.

9 New Business

Proposal for HBA-2 standard

Intel Discussed creating a project proposal for HBA-2. Straw poll on creating an HBA-2 standard, 4 were for, 7 were against, 7 abstained.

DMA diagram issue in ATA/ATAPI-6

There is an error in Figure 33 on page 350 in the transition HPD1:HPD3. In the past we have not done errata in the past for many document errors, we have simply published a change in the next revision. It remains to be determined if an errata is necessary. A change is definitely required for ATA/ATAPI-7. Dan will come forward with a proposal to change the state diagram.

10 Liaison Reports

T10

The latest T10 liaison report from John Lohmeyer has been posted on the T13 web site as e03113r0.

SFF

SFF is continuing to work on a single voltage solution for backplane SATA solutions. They are currently proposing a 12v supply with less regulation on 2.5 inch drives. There is an SFF conference call on this subject 23-APR-03.

Next meeting is May 7, 2003 in Dallas. www.sffcommittee.com.

IDEMA

10.1.1 IDEMA US

10.1.2 IDEMA Japan

Serial ATA II

Many of the specs are due to complete by mid year. The Port Multiplier, due out in 2 weeks. The Cable & Connector Volume is due out after the Port Multiplier. There are 2 phy efforts: 3Ghz internal phy and an external phy at 1.5Ghz and 3Ghz.

The SATA2 specifications have been released to T10. No request has been received from T13.

Curtis Stevens moved and Jim Hatfield seconded that we request the copyright on SATA2: extensions to SATA be released to T13. Motion passed 18-1-0. No comment was made by Dan on his no vote.

11 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. Section 1.2.11 contains the ANSI patent policy. Amy Marasco manages patent issues for ANSI and can be contacted at 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.

There was no response to the call for patents.

12 Action Items

1. Steven Fairchild to bring in a proposal for how to describe tracking and non-tracking implementations and how to organize the description of elasticity buffers.
2. Mukesh to come forward with a document for inclusion into ATA/ATAPI-7 that better defines how the HPA is manipulated.
3. Steve Fairchild will bring in a list of features that need to be added to DCO for ATA/ATAPI-7.
4. Curtis Stevens to turn a new revision of EDD-3.
5. Dan to confirm that we will have a DCO (d03111r0) proposal for the next meeting.
6. Mukesh to turn a new revision of e03107 and forward to Dan for posting.
7. Dan to forward e03107 to INCITS for processing.
8. Dan to request a copyright release for SATA2: extensions to SATA.
9. Dan to create a proposal to fix Figure 33 (page 350) in ATAP/ATAPI-6.
10. Drive manufacturers to determine if DMA Terminate can be removed from ATA/ATAPI-7.
11. Jim Hatfield agreed to come forward with a proposal for which diagrams to move between volumes.
12. Dan Colegrove will acquire all the EIA specifications associated with SATA.
13. Dan Colegrove will bring a proposed conference phone policy.
14. Dan to contact IDEMA US and ask for written liaison reports in the future.
15. Jim Hatfield to bring in a proposal for clarifications to Time Limited Read/Write as E03117r0.
16. Dan to contact Mukesh regarding the approved change in meeting end time.
17. Tony Priborsky to take open issues associated with SATA cable and connector test to SATA.
Several diagrams have been requested.
18. Knut to figure the proper wording for the 2nd paragraph of 14.5.4
19. Tony Priborsky to bring in a proposal on resolving open issue #8

13 Open Issues

1. Should DMA Terminate be removed from ATA/ATAPI-7
2. Cross-references in common areas such as the glossary will have broken links using the current notation.
3. What is meant by this statement in 14.2.6.1: Open or shorted traces with the same length as the input signal traces shall be provided to measure the system input risetime and to synchronize pulses. Traces for crosstalk measurements diverge from each other. Provisions for attenuation reference measurement shall also be provided. What end diverges? Is divergence a requirement? What provisions for attenuation? What are input signal traces?
4. What is meant by this statement in 14.2.6.1: Unless otherwise specified, the requirements in ... are for the entire signal path from the host mated pair connector to the device mated pair connector, but not including PCB traces. A picture is worth a 1000 words.
5. What is meant by this statement in 14.2.6.3: Material certification or certificate of compliance required with each lot to satisfy the Underwriters Laboratories follow-up service requirements.

Do we want to require UL in the standard, or do we want the procedure (UL 94v-0) to be the requirement?

6. How do we handle vague areas of the standard where work is on-going to make the areas more specific in organizations outside T13.
7. The term device in clause 14 may actually refer to phy layers in both host and device. Need to research the difference between device and phy.
8. What is the specification for weakly held in 14.5.4
9. Should we add a state machine to better explain 14.5.6
10. In table 11 COMRESET/COMINIT detector off threshold minimum = COMRESET/COMINIT max value

14 Meeting Schedule

Authorization of ad hoc working groups

Curtis moved and Sumit seconded that we authorize an ad hoc meeting 28-29 May 2003 from 9-5 on both days in Irvine hosted by WDC or PDC to perform a detailed review of ATA/ATAPI-7 with SATA included. Motion passed 9-0-3. Straw poll indicated that 7-8 people would attend

Long term meeting schedule

The meeting dates, locations, hosts, and contacts were reviewed through CY2004 (included below).

CY 2003 Dates	Location	Host	Contact
June 24-26, 2003	San Jose, CA	Phoenix	Mukesh Kataria
August 19-21, 2003	Longmont, CO	Maxtor	Mark Jackson
October 21-23, 2003	TBD	Fujitsu	Sumit Puri
December 16-18, 2003	Las Vegas	Hitachi Global	Dan Colegrove
CY 2004 Dates	Location	Host	Contact
February 24-26, 2004	San Diego, CA	Pacific Digital	Curtis Stevens
April 20-22, 2004	Longmont, CO	Seagate?	Jim Hatfield
June 22-24, 2004	San Jose, CA	Phoenix	Mukesh Kataria
August 24-26, 2004	Longmont, CO	Maxtor	Mark Jackson
October 19-21, 2004	Las Vegas	Fujitsu	Sumit Puri
December 14-16, 2004	TBD	Hitachi Global	Dan Colegrove
NOTE ? Meetings are scheduled for three days.			

As noted above the dates of the next plenary meeting of T13 are June 24 through 26, 2003. The meeting will be held in San Jose hosted by Mukesh Kataria of Phoenix Technologies. A host meeting notice will be sent out on the reflector and will be added to the web site.

Dan suggested that we change the official end time to 1pm on the 3rd day. The group approved this change unanimously.

15 Adjournment

Curtis Stevens moved and John M. seconded that the meeting be adjourned on February 20, 2003 at 12:04pm

Name	Company	Email	Tel
Phil Gardner	Absolute Softwa	phil@ absolute.com	604 730-9851
Richard Kalish	Acer Labs	richard_kalish@acer.com	408 467-7458
Ron Roberts	Adaptec	ron_roberts@adaptec.com	408 957-5640
Kevin Moore	American Megatr	kevinmoore@ami.com	770 326-9119
Larry Barras	Apple Computer	barras@apple.com	408 974-3220
Randy Sharp	Apple Computer	sharp.r@apple.com	408 974-5024
Matt Rooke	CacheVision	mrooke@cachevision.com	408 952-4634
Leroy Fong	Circuit Assembl	leroyf@circuitassembly.com	
Ben Chang	Cirrus Logic	ben@corp.cirrus.com	510 226-2394
Jeff Apodaca	Comm Con	apodaca@commcon.com	626 301-4200
Jeff Wolford	Compaq Computer	jww@anchor.eng.hou.compaq.com	713 514-9465
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Eric Gorham	Consultant		
Tom Coughlin	Coughlin Assoc	tom@tomcoughlin.com	408 978-8184
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Hitoshi Ogawa	Hitachi	hogawa@sdl.hitachi.co.jp	
Shigehiro Mishimagi	Hitachi		
Hiroaki Inoue	Hitachi		
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