Accredited Standards Committee*
X3, Information Technology

To: Membership of X3T10

From: Larry Lamers, Secretary
             Gene Milligan, Chair

Subject: Minutes of ATA Working Group Meeting
             San Jose, CA -- July 18-20, 1995

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Results of Meeting

1.   Opening Remarks

Gene Milligan, the ATA Working Group Chair, called the meeting to order at 9:30 a.m., Tuesday July 18, 1995. He thanked Quantum Corporation for hosting the meeting.

As is customary, the people attending introduced themselves and a copy of the attendance list was circulated. It was announced that general information on X3T10 is available at the head table to any interested party.

2.   Approval of Agenda

The draft agenda was approved with the following discussion points included: S.M.A.R.T., DD7, 8034i; Set Features and FTP Sites.

3.   Attendance and Membership

Attendance at working group meetings does not count toward minimum attendance requirements for X3T10 membership. Working group meetings are open to any person or organization directly and materially affected by X3T10's scope of work.

The following people attended the meeting:

name	company	telephone	email
Mr. Richard Kalish	Adaptec, Inc.	(408) 957-7169	rkalish@corp.adaptec.com
Mr. Tony Kwan	Adaptec, Inc.	(408) 945-8600	tkwan@corp.adaptec.com
Mr. Lawrence J. Lamers	Adaptec, Inc.	(408) 957-7817	ljlamers@aol.com
Mr. David Roe	Adaptec, Inc.	(408) 945-8600	davidr@adaptec.com
Mr. Joe Chen	Cirrus Logic Inc.	(510) 226-2101	chen@cirrus.com
Mr. Steve Horeff	Cirrus Logic Inc.	(510) 226-2341	horeff@cirrus.com
Mr. Hale Landis	Consultant	(303) 548-0567	landis@sugs.tware.com
Mr. Dan Colegrove	IBM Corp.	(507) 286-5558	colegrove@vnet.ibm.com
Mr. Duncan Penman	IIX Consulting	(408) 730-2565	penman@netcom.com
Mr. Bob Jackson	Iomega Corp.		jacksonb@iomega.com
Mr. LeRoy Leach	Maxtor Corp.	(303) 678-2828	leroy_leach@maxtor.com
Mr. Pete McLean	Maxtor Corp.	(303) 678-2149	pete_mclean@maxtor.com
Mr. Yasu Kinoshita	Mitsumi	(408) 567-6250	10224.1736@compuserve.com
Mr. Peter Brown	Oak Technology, Inc.	(408) 737-0888	peterb@corp.oaktech.com
Mr. Lyle Adams	Quantum Corp.	(408) 324-7301	ladams@asic.qntm.com
Mr. John Brooks	Quantum Corp.	(408) 894-5871	jbrooks@asic.qntm.com
Mr. Farbod Falakfarsa	Quantum Corp.	(408) 894-4066	ffalakfa@qntm.com
Mrs. Paraminder Gill	Quantum Corp.	(408) 894-6163	parmg@asic.qntm.com
Mr. Marvin Lum	Seagate Technology	(408) 439-7130	mlum@cdg.seagate.com
Mr. John Masiewicz	Seagate Technology	(408) 439-2152	
Mr. Gene Milligan	Seagate Technology	(405) 324-3070	gene_milligan@notes.seagate.com
Mr. Ron Werbow	Seagate Technology	(805) 582-3815	ron_werbow@notes.seagate.com

Mr. Carl Bonke   Western Digital Corp. (714) 932-7622 bonke@dt.wdc.com
Mr. Tom Hanan   Western Digital Corp. (714) 932-7472 hanan_t@a1.wdc.com
Mr. Devon Worrell   Western Digital Corp. (714) 932-7042 worrell@dt.wdc.com

4.   Document Distribution

95-258r1 - Proposal for Working Draft of ATA+PI
95-294r0 - Proposed Set Feature Command Change

5.   Review of Action Items

23)   Duncan Penman to discuss moving the Systems Issues study group to the proposed T13 meeting week. Completed.
22)   Farbod Falakfarsa to do simulation on the effect of the 10k pull-up resistor on data signals. Completed.
23)   Jim McGrath to prepare proposal based on SFF 8034i as an informative annex for ATA 3. Completed.
24)   Gene Milligan to contact Compaq on copyright issue related to SMART document. Completed.
25)   Gene Milligan to request Seagate letter on patent position. Completed. Letter sent to X3T10 Chair.
26)   Pete McLean to convert 95-258 into a properly formatted overlap proposal. Completed.
27)   Tom Hanan to clarify ATA & ATAPI reflector usage. Completed.

6.   ATA-2

6.1   X3 Public Review Comments (If Any) - Finch]

No additional comments received.

7.   ATA

7.1   ATA-3 Working Draft Review [McLean]

The following list of issues arose during the document review. Most of these will be addressed by reflector traffic, some will be dealt with at the next meeting:

1.   Should CS0=A and CS1=A be changed to reserved?
2.   The term 'not used' needs to be defined.
3.   What is the result of writing a register with BSY=0 and DRQ=0?
4.   Need to define when reading a register is valid.
5.   The term 'media access' needs to be defined.
6.   What is the sequence for status register changes following commands or resets?
7.   The error bits need a modern definition.
8.   Should IDNF be used to report invalid address?
9.   Should the register definitions of use be moved to the command descriptions? error definitions?
10. Is DMA protocol required in ATA-3?
11. Need Mr. Landis's 95-200 proposal on the effects of SET MULTIPLE.
12. Should single-word DMA protocol be deleted?

Pete McLean showed examples of his method of re-formatting the diagrams in clause 9. The consensus was that this approach is much better and should be incorporated into the document.

Tom Hanan pointed out a problem with the PIO data in transfer between item g) and h). Because of the textual descriptions the timing relationships are not always clear and faster systems get tripped up.

In Clause 5.2.10, items 3 and 4, have an issue regarding their affect on device 0 or 1 when clearing pending interrupts.

7.1.1   Motion on SFF-8035i

The following motion was deferred from the last meeting.

Tom Hanan moved and John Brooks seconded that SFF 8035 (S.M.A.R.T.) be incorporated into ATA-3 in a normative fashion at the technical editor's discretion After the following discussion the motion carried 8:0.

Gene Milligan reported that he had contacted Ken Bush of Compaq. Ken agreed that the ATA WG should deal with this. The copyright notice was removed prior to submission to SFF. SFF-8035i serves as an initial implementation point and it is understood that some changes might result when it is incorporated into ATA-3.

Tom Hanan stated that common practice in the industry is not fully included in SFF 8035i and extensions may be needed. Pete McLean noted that SFF 8035i uses vendor specific command codes.

7.1.2   Data Bus Biasing - McGrath

Farbod reported on the simulation of 10k ohm pull down / pull-up resistor. Farbod reported that no difference was observed in the simulation. Either works, but mixing them should be avoided. The recommendation should be that a 10k ohm pull-down be used on the data bus on the host and none on the devices. Pete offered to add the following note:
"Devices shall not have a pull-up resistor on DD7. it is recommended that a host, have a 10k ohm pull-down resistor and not a pull-up resistor on DD7, to allow a host to recognize the absence of a device at power-up. It is intended this recommendation become mandatory in a future version of this standard."

7.1.3   Incorporation of 8034l as annex. - McGrath

See 10.1.

7.1.4   Cable length - Allan

Jim McGrath is chartered to lead an SFF SWIG, on dual-bus, cable integrity and specification. Tentatively the initial meeting is planned for August 22, 1995.

7.2   Strong Command Overlap and Command Queuing Proposal Update [McLean]

Document 95-258r1 is the proposal for review.

Devon stated that now the host has to be aware of context (i.e., remember what was done previously) and cannot blindly read the registers.

Pete agreed to improve the definition so that the content of registers and when they change is specified. Pete will attempt a state diagram to document the service process and register transitions.

Hale noted that there are three ways to abort commands; the most interesting is the host changing the device bit in the drive/head register. Writing the command register does not reliably abort DMA commands. The addition of overlapped commands further complicates the scenario.

Devon suggested that the byte count be changed to a word count and a starting block to allow out-of order transfers.

7.3   Mode 3 DMA proposal [Hanan]

Tom Hanan presented a timing proposal for a mode 3 synchronous DMA data transfer. There are issues with having a good enough cable and host connection to make it work. This proposal represents a stake in the ground, but signal integrity issues need to be resolved. The timings are at the drive; implying that the data hold time incorporates the cable skew and connector skew at the host. The production tolerance on line drivers needs to be tightened up; active feedback for control of slew rates will be required to meet the requirements.

A hold time of at least zero will be added for DIOW to DMARQ.

7.4   IDENTIFY DRIVE data in support of host requirements [Stevens]

There was no business to conduct on this item.

8.   ATAPI

8.1   ATAPI Working Draft Review [Hanan]

Pete McLean pointed out that ATAPI defines word 47 bits 13-15 differently than ATA-3. The ATAPI draft will move these bits to word 48. Bit 12 of word 49 will be redefined to eliminate the PIO distinction.

What should the definition of word zero be?

Devon Worrell moved and Peter Brown seconded that 0xb equate to ATA, and 1xb equate to ATAPI, be incorporated into ATA-3. The motion carried 9:0.

Also add a footnote to the effect that bit 15 shall not be set in order to maintain compatibility.

Disposition of word 71 -
Tom Hanan moved and Pete McLean seconded that the definition of Interface Type in word 71 be removed. The motion carried unanimously.

Tom Hanan moved and Dan Colegrove that IDENTIFY DRIVE command exist in each document (ATA and ATAPI) and the data fields be resolved to eliminate conflicts. The motion passed unanimously.

Words 73 and 74 will be used for the major and minor version numbers. Words 71 and 72 will be reserved for overlap.

8.2   Other ATAPI Items []

There was no business to conduct.

9.   Old Business

9.1   ATA+PI []

There was no business to conduct beyond the command overlap in an earlier agenda item.

9.2   New Technical Committee []

There was no business to conduct but the Chair answered some questions regarding the formation of new committees.

10.   New Business

10.1   Proposal for an informative Annex F based upon SFF 8034l []

Jim McGrath reviewed the material for annex F. He pointed out that many designers assumed a lumped capacitance for a load and this is often an order of magnitude greater than what is actually experienced.

Jim stated that he would supply a copyright release letter so that this document (95-186r2) could be included in the mailing.

The illustrations were all prepared using a model based on 12 ma drivers. Jim stated that the simulations will be redone with the minimum of 4 ma drivers.

Tom Hanan moved and Hale Landis seconded that the dual-cable shared environment be included in the annex. The motion passed unanimously.

10.2   Proposal for SET FEATURES Command Change [Masiewicz] (95-294r0)

This proposal offers a method to enable/disable automatic defect reallocation feature. The implementation is vendor specific. Amended to included "all reassignment".   The consensus was to incorporate these code definitions into ATA-3.

10.3   FTP Site Organization []

Comments relative to SFF-8020 goes to ATAPI reflector, all other ATA related comments should go to the ATA reflector.

Documents are in \pub\standards\ or pub\otherdocs\.

11.   Call for Patents

Gene Milligan requested that anyone aware of any patents required for the proposals be disclosed early in accordance with the ANSI patent policy. He also pointed out that IBM has made a blanket offer of any of their patents that may be required by the interface standards.

As noted in earlier minutes the Secure Mode proposal involves patents pointed out by Pete McLean and he stated that a letter has been submitted by Maxtor. He also mentioned an IBM patent and Dan Colegrove noted that document 94-125 contains the letter regarding the ANSI patent policy.

12.   Action Items

28) Pete McLean to check with PCMCIA on removal of 8-bit transfers.
29) Jim McGrath to supply copyright release for annex F document.

13.   Open Issues List

a)   clearing of pending interrupts and how it relates to writing the command register or reading the status register.
b)   when is DMA mode
c)   need to add concept of PIO transfers for register access (during DMA registers are not accessible) [data register > PIO; data port > DMA]
d)   measurement of rise/fall time and change to 100 pf lumped capacitance to more realistic number (18-25)
e)   an annex is needed on the logical impact of shared cables.

14. Future Meeting Schedule

August 22-25, 1995 at the Red Lion in San Jose, CA hosted by Quantum.
September 20-22, 1995 perhaps at the Crown Sterling Suites in Milpitas or perhaps the Red Lion in San Jose, CA hosted by Quantum.
October 18-20, 1995 at the ??? in Irvine, CA hosted by Phoenix Technologies.
November 29-December 1, 1995 - at the WD facility in Irvine, CA hosted by Western Digital.

The start time is moved to 9:00 am for meetings in San Jose, CA.

The meeting week is:
Tuesday

	Tuesday	Wednesday	Thursday	Friday
9:00 am - 12:30 pm	ATAPI	ATA Mode 3 DMA	ATA-3	ATA-3
2:00 pm - 5:30 pm	Cable SWIG	ATA-3	ATA-3	System Issues

15. Adjournment

The meeting adjourned Thursday at 4:30 pm.