Accredited Standards Committee[*]
X3, Information Processing Systems

Doc. No. X3T10/95-256r0
Date: 04/18/98
Project: 1120 & 2008
Ref. Doc.:
Reply to: G. Milligan

To: **Membership of X3T10**

From: Lamers/Milligan

Subject: Minutes of X3T10 ATA Working Group - June 21-22, 1995

Agenda

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1. Opening Remarks

Gene Milligan convened the meeting at 9:30 p.m. He thanked Jim McGrath of Quantum for hosting the meeting. He also requested that Larry Lamers take the minutes and thanked him for accepting the request.

As is customary, the people attending introduced themselves. A copy of the attendance list was circulated for attendance and corrections.

It was stated that the meeting had been authorized by X3T10 and would be conducted under the X3 rules. Ad hoc meetings take no final actions, but prepare recommendations for approval by the X3T10 task group. The voting rules for the meeting are those of the parent committee, X3T10. For the ad hoc, other than straw votes, the voting rules are: one vote per participating company.

The minutes of this meeting will be posted to the X3T10 BBS and the ATA Reflector and will be included in the next X3T10 committee mailing.

2. Attendance and Membership, Introductions

Attendance at working group meetings does not count toward minimum attendance requirements for X3T10 membership. Working group meetings are open to any person or company to attend and to express their opinion on the subjects being discussed.

The following people attended the meeting.

name	company	telephone	email
Mr. Lawrence J. Lamers	Adaptec, Inc.	(408) 957-7817	ljlamers@aol.com
Mr. Richard Kalish	Adaptec, Inc.	(408) 957-7169	rkalish@corp.adaptec.com
Mr. Les Cline	Cirrus Logic	(510) 623-8300	lesc@corp.cirrus.com
Mr. Joe Chen	Cirrus Logic Inc.	(510) 226-2101	chen@cirrus.com
Mr. Danny Ong	CMD Technology	(714) 454-0800	ong@cmd.com
Mr. Sam Lin	CMD Technology	(714) 454-0800	sam@cmd.com
Mr. Marc Noblitt	Conner Peripherals	(303) 682-8408	marc.noblitt@conner.com
Mr. Bill Willette	Dell Computer	(512) 728-9068	bill_willette@dell1.us.com
Mr. I. Dal Allan	ENDL	(408) 867-6630	2501752@mcimail.com
Mr. Kevin Calvert	Future Domain Corp.	(714) 253-0522	kevinc@fdc.mhs.compuserve.com
Mr. Anthony Yang	Hitachi America Ltd	(408) 653-0315	
Mr. Motoyasu Tsunoda	Hitachi Micro Systems	(408) 922-4142	mtsunoda@hmsi.com
Mr. Randeep Sidhu	Hitachi Micro Systems	(408) 922-4071	rsidhu@hmsi.com
Mr. Dan Colegrove	IBM Corp.	(507) 286-5558	colegrove@vnet.ibm.com
Dr. Gerald Marazas	IBM PC Company	(919) 543-6892	marazas@bcrvmpc2.vnet.ibm.com
Mr. Joe Bennett	Intel Corp	(916) 356-3722	jbenett@pcocd2.intel.com
Mr. Mark Shipman	Intel Corporation	503-696-2318	mark_shipman@ccm2.hf.intel.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. Christopher D'Iorio	NEC Technologies, Inc	708-238-7799	cd-iorio@nectech.com
Mr. Karl Schuh	Nexcom Technology	(408) 730-3690 ext 15	karls@schuh.com
Mr. Peter Brown	Oak Technology, Inc.	(408) 737-0888	peterb@corp.oaktech.com
Mr. Takayuki Fujioka	Panasonic MKE	408-945-5606	100207.2272@compuserve.com
Mr. Curtis E. Stevens	Phoenix Technologies	(714) 440-8330	curtis_stevens@bannet.ptltd.com
Mr. Chi-Chen Wu	Promise Technology	(408) 452-0948 ext 220	chiwu@promise.com
Mr. Farbod Falakfarsa	Quantum Corp	(408) 894-4066	ffalakfa@qntm.com
Mr. John Brooks	Quantum Corp	(408) 894-5871	jbrooks@asic.qntm.com
Mr. Lyle Adams	Quantum Corp	(408) 324-7301	ladams@asic.qntm.com
Mrs. Paraminder Gill	Quantum Corp	(408) 894-6163	parmg@asic.qntm.com
Mr. James McGrath	Quantum Corp.	(408) 894-4504	jmcgrath@qntm.com
Mr. Gene Milligan	Seagate Technology	(405) 324-3070	gene_milligan@notes.seagate.com
Mr. John Masiewicz	Seagate Technology	(408) 439-2152	
Mr. Ron Werbow	Seagate Technology	(805) 582-3815	ron_werbow@notes.seagate.com
Mr. Stephen G. Finch	Silicon Systems, Inc.	(714) 573-6808	5723283@mcimail.com
Mr. Mike Yokoyama	Sony Electronics, Inc.	(408) 955-4344	masayuki@cppc.sel.sony.com
Mr. John Lohmeyer	Symbios Logic		
Mr. Patrick Mercer	SyQuest Technology Corp.	(510) 226-4000	patrick.mercer@syquest.com
Mr. Devon Worrell	Western Digital Corp.	(714) 932-7042	worrell@dt.wdc.com
Mr. Tom Hanan	Western Digital Corp.	(714) 932-7472	hanan_t@a1.wdc.com

3. Document Distribution

X3T10/95-254R0	Proposal for ATA+PI document	P. McLean
X3T10/95-256R0	Minutes of ATA Working Group - 6/22-23/95	Lamers/Milligan
X3T10/95-257R0	Comments on WD Overlap Proposal	J. McGrath
X3T10/95-258R0	Overlap Features	D. Worrell
X3T10/95-259R0	ATA Project Schedule	D. Worrell

4. Approval of Agenda

The agenda was approved as distributed.

5. Review of Action Items

7)   Jeff Rabbe to check to see if Intel will release for open control the definitions presently published in SFF 8038i. Completed. Joe Bennet stated that Intel will not open this to public control.

16)   Tom Hanan to provide the maxpower specification developed internally for 1.8-inch power management. Carried over. Reassigned to HP. Tom Hanan will provide the contact point at HP.

19)   Tom Hanan to prepare revision 0 of ATAPI (X3T10/1120). Completed.

20)   Gene Milligan to request a technical committee be formed for ATA projects. Completed

21)   Pete McLean to generate rev 2 of ATA-3. Completed

22)   Tom Hanan to generate rev 0 of ATAPI. Completed. (Duplication of (19)).

23)   Duncan Penman to discuss moving the Systems Issues study group to the proposed T13 meeting week. Carried over.

6. ATAPI Project 1120

6.1 Review of ATAPI working draft [Hanan]

Tom distributed a revision 0.2. The document includes extractions from SFF-8020 intended to provide transport mechanism and protocol details. It does not redefine ATA signals. The document includes single device overlap and does not contain the proposed proxy interrupt.

Tom discussed the reflector alternatives. Tom plans to have the ATAPI reflector be for SFF-8020. The ATA reflector will be used for all of the ATA related X3 projects. Dal requested that Tom merge the ATAPI and MMC reflectors.

Peter Brown did not agree with the conclusion of the group that the ATA reflector should be used for project 1120D.

6.2 ATAPI other items []

Should command sets be included in ATAPI? Tom Hanan stated that resolution of the document architecture is needed.

Jim McGrath asked if new proposals for additions to ATAPI are open for consideration. Gene Milligan responded that this is the purpose of this agenda item.

Chris D'Iorio emphasized that the original project authorization was incorrect. He urged that the ATAPI command set should be included in 1120. He acknowledged that some people do want common commands for SCSI and ATAPI devices but he stated that the goal does not reflect the real world.

7. ATA-3 Project 2008

7.1 Review of ATA working draft [McLean]

Pete McLean reported that he prepared an updated working draft (rev 2) including the items approved at Harrisburg.

The 10k resistor recently documented on a data bus line on the host side was discussed. The resistor was intended to make it easier to do POST when there are no drives attached. The current ATA document does not prevent using resistors, but does not advocate them. It was suggested that SFF-8034 might be an issue with respect to the added resistor. John Masiewicz pointed out that if it is an issue the issue would have already existed since either the host or the device was allowed to have the resistor all along. Les Cline pointed out that dual channel host silicon can have issues with 10k resistors. The current recommendation from Quantum is to use 22k ohm resistors on the drives. If a drive has a pull-up and the host has a pull-down, then an undriven signal is in an indeterminate state.

Steve Finch suggested that Table 6 should be changed to indicate where the resistor is and change the shall to a may.

A two step process was advocated to determine if the resistor is useful and, if it is, then develop appropriate wording. Farbod Falakfarsa volunteered to do a simulation.

Pete questioned the placement of power-on timing. The timing should be off the trailing edge of reset. BSY should be allowed when reset is asserted but all signals are undefined during reset. The 31 seconds starts when reset goes away. (see fig. 8).

Steve Finch pointed out that on Page 65 word 71 bits 15-7, there is an inconsistency, FF should mean not specified.

There was a discussion on subclause 4.4 over cable length and cable equivalents. Should SFF 8034i be included as an annex?

Dal Allan moved and Rick Kalish seconded that ATA-3 subclause 4.4 be modified to stated that the cable shall not exceed 12 inches and that dual cable situations have other system considerations not addressed within this standard see information annex X (i.e., SFF 8034i).

Steve Finch moved to divide the question; Curtis Stevens seconded; and there was no objection.

Reducing cable length to 12 inches; the motion failed 1:17.

Including SFF 8034i as an informative annex; the motion carried 12:3.

Steve Finch is not opposed to the intent, however he notes that the current contents needs substantive work to be acceptable in a standard.

Jim McGrath requested guidance for deadlines for annex material to be included into ATA-3. See Agenda Item 10.2.

Rick Kalish questioned the references to shielded cable; particularly since that cable has different characteristics. There is an inconsistency in subclause 5.1. It was agreed that the non-shielded term in 5.1 should be removed.

Tom Hanan moved and John Brooks seconded a motion to incorporate SFF-8035i into an annex of ATA-3. Jim McGrath stated that the document is copyrighted by Compaq. Gene Milligan tabled the motion until he corresponds with Compaq informing them of this pending motion and requesting their concurrence.

Dan Colegrove requested that at least the affected code values in ATA should be changed from vendor specific to reserved for the S.M.A.R.T. function in acknowledgment that S.M.A.R.T exists and will impact the standard.

7.2 ATA and ATAPI differences [McLean]

Pete McLean described the second document he had prepared that includes material showing the differences between ATA and ATAPI. This document is X3T10/95-254. He concluded that the only technical conflict he had noticed was the duplication of ID word numbers between the ATA-3 revision information and an ATAPI ID word. The ad hoc agreed to resolve the conflict by having Pete slide the revision words down to eliminate the conflict.

7.3 6/2/95 Command Overlap ad-hoc report []

Curtis Stevens reported. Three presentations were given: Tom Hanan on service and release, Devon Worrell on ATAPI features, and Jim McGrath on ATA issues.

Pete McLean presented his proposal (see 95-194r2.doc) on command overlap.

The meeting heard presentations on the views of the future directions for ATA and ATAPI. The straw polls at the end of the meeting were rushed because of airline schedules but the most meaningful one on whether the proxy interrupt or the wired-or approach should be taken on interrupts went 12 to 6 in favor of the proxy interrupt proposal.

The voters were Oak, Microsoft, Opti, Cirrus, IIX, Panasonic, Hitachi, CMD, Intel, Conner,WD, Phoenix (12)
Quantum, Adaptec, IBM, SSI, Symphony, Maxtor (6)

The vote on the use of service & release vs overlap mode was 10 in favor of service & release and 8 in favor of overlap.

The differences between the two proposals are:
1) Interrupts - Proxy vs Wired-or
2) Drive Selection - Service/Release vs CS0/CS1
3) Tags - Extended Registers vs New Registers vs Reuse Registers
4) Enable - New Commands vs Set Features

There is also some timing issues to resolve on interleaved DMA .

7.4 Strong Command Overlap and Command Queuing Proposals []

Jim McGrath reported on some agreements reached over lunch on his questions in 95-257r0.

On item 1) Byte transfer does not imply a time-out on data transfer, once the first word has transferred the byte count can be changed by the device; to avoid extra interrupts the drive can keep DREQ asserted to indicate that a new byte count has been loaded and extend the data transfer.

On item 2) The recommended procedure is to manage basic overlap in firmware, latch the registers, start the background operation, and fake the silicon into thinking that a command has been completed and that the SERVICE command is a new follow-on command. This would allow debugging of the protocol; not intended for production.

On items 3) & 8) Make the tag value zero bit based by removing the DMA bit. The method of transfer is encoded in the status bit, not encoded in the opcode as it should be and will result in 4 new opcodes.

On item 4) layout of task file registers when an error occurs; sector register is reused for tag value; use the sector count register for tag values so the CHS register can report error location; as a consequence the features register is used for the sector count.

On item 5) an unclaimed bit will be found to report queue cleared.

On item 6) agreed that a non-tagged command received while tagged commands exist aborts all commands.

On item 7) Before release BSY on the initial command the drive should be allowed to do a data transfer (auto-write) without generating an interrupt.

Jim and Tom are planning to work on a proposal with more specificity that could be merged into an ATA-3 document to produce a definitive proposal.

Can existing bus-master bridge chips be programmed to generate an interrupt at terminal count or is it just a pass through from the drive? Joe Bennet responded that it is just a pass through, byte count at zero does not cause the bridge to generate an interrupt.

Should PIO mode be allowed for overlapped commands? Recommended but not decided.

Curtis Stevens moved and Joe Bennet seconded that the Service & Release Overlap Proposal (X3T10/95-258r0) be used as the basis for future work on command overlap.   The motion carried 13:2. Rick Kalish stated that 95-194 has better compatibility with existing drives and has better potential for performance. Dan Colegrove stated that proxy interrupt is difficult to make work with multiple drive vendors, also that inclusion of the priority interrupt prevents an opportunity to really improve automation for ATA that would be a step forward in performance and simplicity.

Tom Hanan moved and Curtis Stevens seconded that Pete McLean be assigned the task of converting 95-258 into specification format.

Pete requested that voting be deferred until item 10.3. (Chairman's Note: The minutes do not reflect a vote specific to this motion. It could be construed that vote (1) under item 10.3 applies to this motion. Does anyone have notes indicating we actually took a vote on the above motion?)

7.5 GT 16.6 MB/s DMA transfer rates [Chen]

Tom Hanan requested a SWIG meeting be established to develop a proposal.
Tom Hanan moved and Chi Chen seconded that a SWIG meeting be authorized for a GT 16.6 MB/s proposal.
The motion failed 7:11.

Tom then stated that he will send out a modification of the Chen proposal over the reflector and requested that a specific time slot be provided for this item. The slot will be July 19, 1995 3 p.m. - 5 p.m. Mode 3 DMA Timing.

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

Curtis Stevens reported that he was not yet ready to open discussion on this item.

8. ATA-2 Project 0948D

8.1 X3 Public Review Comments []

No comments yet. Steve Finch indicated he had received some editorial comments and that he would propose a response on the reflector.

9. Old Business

9.1 Multiple Connector ATA Implementations [McGrath]

No business. Delete from future agenda, covered in the discussion of a new annex proposal.

10. New Business

10.1 Project Proposal for ATA + PI X3T10 95-219r0

Gene Milligan reviewed the results of the letter ballot. The ballot passed 50:4:0:5. See X3T10/95-034 for the voting details and comments.

Steve Finch moved and Tom Hanan seconded that a statement be added to ATA + PI project proposal that it is a follow-on project to ATA-3 (2008) and ATAPI (1120) as a response to the comments from Dal Allan. The motion carried 16:0.

Dal Allan moved and Curtis Stevens seconded that profiles/service interface for system issues per device type be included in the scope of the ATA + PI project proposal.. The motion carries 13:1.

Dal Allan moved and Curtis Stevens seconded that Seagate comment #3 be rejected. The motion carries 12:2.
Dan Colegrove stated that too many features and functions make it difficult to implement.

Add note to legal considerations regarding the security patents.

Based upon Tom Hanan's explanation of the WD comment, Gene Milligan moved and Peter Brown seconded that the response to the WD comment be to recommend to X3T10 that they withdraw the project proposal and turn it over to the new TC for further action. The motion failed 3:11.

Steve Finch moved and Larry Lamers seconded that the recommendation to X3T10 be to reject the WD comment. The motion carried 12:3.

10.2 Comment Resolution on formation of a new Technical Committee

Gene stated that the letter ballot requesting the formation of a new technical committee was a recommendation, there is not a requirement to address the negatives or the comments, but he felt it is better to address them.

It was moved by Tom Hanan and seconded by Curtis Steven that the ATA working group not address the comments in regard to the letter ballot recommending formation of a new TC. Failed 5-6

Gene reviewed the received comments. During the ensuing discussion:

Tom Hanan moved and Peter Brown seconded that the response to the comments concerning the requirement for additional meetings, be that it is possible that a new technical committee would only require one plenary meeting per year and that the meeting could be co-located with X3T10 and that technical issues could be discussed electronically and via letter ballots thus limiting the need to hold additional meetings.

passed: 6:4

Peter Brown suggested that this comment also addresses excessive travel and west coast meeting location issues. There was general agreement to this statement.

It was moved by Tom Hanan and seconded by Curtis Stevens that the identified overlap of ATA and SCSI activities does not exist today, as the bulk of the ATA technical activities are currently not co-located with SCSI technical activities of X3T10 and the current ATA activity during the X3T10 meetings is primarily an update on ATA activities and that a report to X3T10 would be sufficient to meet these needs.

passed: 8:1

10.3 Document Strategy and Schedule

Gene Milligan presented a foil with the schedule for current projects and a straw man proposal for the new proposed project.

Tom Hanan presented his view of the ATA layering into an interconnect layer, protocol layer, and command layer. He stated that there is a need for a roadmap.

Steve Finch moved and Dal Allan seconded that the foil as presented by Gene be the document strategy and schedule, that ATA-3 incorporate the changes as noted in 95-254 covering the ATA/ATAPI differences, and that each document's introduction include the roadmap.

Dal Allan requested the question be divided:
1) accept the foil as the schedule; letter ballot 2008 and 1120 in 11/95; letter ballot ATA + PI 6/96; the motion carries 12:1
      Joe Chen stated that he could not vote yes without knowing the content.
2) include a roadmap; the motion carries 13:0.
3) use 95-254 as basis the for 2008 The motion fails 3:11.
      Tom Hanan stated that in his opinion the changes are minimal and would not cause a schedule delay.

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

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

13. Meeting Schedule

The July meeting is in process of being revamped. Possibly move SI meeting to Friday, so a document review meeting can be done on ATA-3 and ATAPI. The timing will be finalized over the reflector.

July 18-20, 1995 at the Red Lion in San Jose, CA hosted by Quantum.
        July 19 12:00-3:00 Annex F, 3:00-5:00 Mode 3 DMA
August 23-25, 1995 at the Crown Sterling Suites in Milpitas, CA hosted by Quantum.
September 20-22, 1995 at the Crown Sterling Suites in Milpitas, CA hosted by Quantum.
October 18-20, 1995 at the ??? in Irvine, CA hosted by Phoenix Technologies.
November 29-December 1, 1995 - at the ??? in Irvine, CA hosted by Western Digital.

14. Adjournment

The meeting adjourned at 12:00 p.m. on June 23, 1995.