Minutes of the ATA-Extensions Special Working Group Meeting
Held January 28, 1994, in Milpitas, CA, at Crown Sterling Suites Hotel.

Chaired by: Steve Finch, SSI.
Hosted by: Joe Chen, Cirrus Logic.
Minutes recorded by: Robbie Shergill, National Semiconductor.

Following documents were distributed in this meeting:

- 94-027r1: Proposal for Data CRC across the Cable (R. Kalish, Adaptec)
- _____: 16MB/s Timing Numbers (Steve Anderson, Conner)
- _____: Minutes of the December SSWG meeting (R. Shergill, National)
- X3T9.2/0948D rev 2: ATA-2 Proposed Working Draft (Steve Finch, SSI)

1. Steve Finch opened the meeting at 9:30AM by thanking the host and stating
the purpose of the meeting and some pertinent ANSI mechanisms. He asked each
attendee to introduce themselves and also sign the attendees list.

2. Agenda for this meeting was circulated by Steve Finch. It was modified
and accepted.

   1. Introductions

   2. Approval of Agenda

   3. Attendance and Membership (Group Introductions)

   4. Time and Place for Next Meeting

   5. Spec Documents
       5.1 ATA-2 Status
       5.2 ATA-2 Editors' Meeting
       5.3 ATA Reflector
       5.4 ATA-3 Project Proposals

   6. High Speed Transfers
       6.1 Data CRC
       6.2 16MB/s Timings

   7. Adjournment.

3. Attendance List

NAME	COMPANY	PHONE
Al Pham	Adaptec	408-945-2560

Joe Chen	Cirrus Logic	510-226-2101
Ken Bush	Compaq	
Steve Anderson	Conner Peripherals	
Dan Colegrove	IBM	
Larry Lamers	Maxtor	408-432-3889
Robbie Shergill	National Semi.	408-721-7959
Jim McGrath	Quantum	408-894-4504
Farbod Falakfarsa	Quantum	
John Brooks	Quantum	
Clyde Nagakura	Quantum	
Jim Wilshire	Quantum	408-894-5245
Mike Carpenter	Q-Logic	
Peter van Beckum	Samsung	
Hank Davenport	Samsung	
John Masiewicz	Seagate	408-439-2152
Gene Milligan	Seagate	
Steve Finch	Silicon Systems	714-573-6808
Tom Hanan	Western Digital	714-832-7472

4. Time and Place for the Next Meeting:

   Feb 23: Milpitas. (hosted by Quantum; at Crown Sterling Suites hotel)
   Mar 14: Newport Beach (as part of X3T9.10)
   Mar 30: TBD (possibly Western Digital, Irvine)

It was conveyed by Steve Finch that, in response to this group's desires,
John Lohmeyer is suggesting that ATA working group be held on Thursday
mornings of the Plenary week and SFF on Friday AM. This was discussed at
last plenary and will be decided at the next plenary in March.

5. Spec Documents.

5.1 Status:
Steve Finch circulated rev 2 of ATA-2 draft. The change bars are relative to
rev 1, not ATA 4.0a. If there is quick agreement on 16MB/s then we will
include this mode in ATA-2 also; but we will not delay the spec for this
reason.

Tom Hanan said Western Digital is compiling a table of "shalls" and
"shoulds" from the spec. He asked if the group would like for it to be
included in the spec. Steve Finch opposed this idea on the basis that this
will deemphasize the "is's" and some of these are quite necessary to
implement. John Masiewicz suggested that we should just highlight the
"shalls" and "shoulds" in the actual spec - all agreed on this. The group
agreed that this issue can be revisited once we have seen Tom's list.

5.2 Editors' Meeting:
Steve will be setting up the next editors' meeting by next Monday and put it
on reflector. He intends to hold it in Southern California. The editors will
go through the document in detail.

5.3 Reflector:

Tom Hanan reported that sequence numbers are being attached to each item now. In addition, Western Digital is in the process of putting in the ability for people to see a register of postings with sequence numbers. Tom is working with Larry Lamers to add the doc numbers to this same list, and at a later time, the ability to obtain doc numbers from it.
Tom asked if people want a separate political reflector. There was very little desire for such a reflector. The sense of the group was that political discussions should simply be limited by way of self-discipline.

5.4 ATA-3 PROJECT PROPOSALS:
Steve Finch described the four proposals he is working on.
Tom Hanan asked how one can become chair for any of these. Gene Milligan explained that there will be only one chairperson; and then an editor per document. Steve Finch further explained that there will be a primary editor for each document and a secondary editor for coordinating between the four editors/documents. Steve is prepared to serve the function of secondary editor.

6. High Speed Transfers.

6.1 DATA CRC:
Al Pham (Adaptec) presented the proposal. In answer to a question, he agreed that a possibility would be to do Set Features instead of new commands. Tom Hanan said that he doesn't like Set Features method.

John Masiewicz said that the first question is - do we need it at all? Seagate doesn't want any additional commands. All ATA commands end up becoming mandatory. Additionally, if this is really necessary, then the OS can append CRC to files.

Steve Finch objected that this is not a complete solution because the non-data transfers are not protected. Tom Hanan pointed out that WD recommends that non-data transfers should be done at Mode 0 - this proposal should be covered.

Joe Chen asked what was adaptec's reason for bringing this proposal. Al Pham answered that some of Adaptec's customers are asking for it. Joe Chen and John Masiewicz asserted that that depends on who the customer is - major OEMs have to buy into it. Ken Bush (Compaq) said that we don't need a new feature. We do need integrity, but the primary place to do it is in the definition of the high speed timing. Compaq doesn't see the need for to evangelize this issue.

Steve Finch suggested that Adaptec ask for a data integrity SSWG so the whole issue can be discussed.Tom Hanan offered to lead such an effort. John Masiewicz and Robbie Shergill agreed with this approach, but asserted that ATA-2 work shouldn't be impacted because of this. Gene Milligan further added that we should not lose sight of the fact that we want to keep ATA cheap and simple. Steve said that that SSWG will have to work outside of here. If that SSWG feels that 16MB/s needs CRC then they can bring it to us.

In conclusion, it was agreed that the issue of data integrity should start

as a reflector discussion to be followed with a possible SSWG; and that we don't want to impact the current ATA-2 work.

6.2 16MB/s Timings:

Steve Anderson (Conner) opened this discussion by presenting his proposal. He asked if we are trying to define this mode under SFF or ATA? Steve Finch clarified that the intention is to do it in ATA and then ask SFF to do an informational document. John Masiewicz would prefer doing it as part of ATA-2 document. Tom Hanan will continue to edit the current proposal document; eventhough the info has come from many sources. Document number is 94-045.

A long discussion ensued on the 16mb/s timing numbers. Although certain timing values have to be carefully chosen because of their impact on various disk controller designs, the key reason for the complexity of this issue is that bridge controllers have to work at various system clock frequencies.

One thing that became clear was that in the current spec t0 does not cover the other edge-reference possibility and this should be clarified. That is, the cycle time has to be observed from deassertion-edge to deassertion-edge also. Tom Hanan pointed out that there is a real possibility that a bridge adapter can violate this spec when system frequencies are switched.

The other thing that became clear was that access time in terms of $(t_k + t_E)$

needs to be specified. For the purpose of further discussion this time will be referred to as (t_u).

Each individual spec was also discussed. Keeping in mind that $(t_D + t_k)$ is important, we can reduce t_D to 70, but then t_K has to be 25.
Three options were offered and a vote was taken:

	a	b	c
td	70	75	70
te	50	55	50
tk	25	20	20
vote:	10	3	0

So the group went with option A. The group was much more agreeable to the rest of the timings.

Steve Anderson also suggested that a note be added to both PIO and DMA tables that clarifies that the cycle time a drive supports is returned in ID data. This was agreed to.

Steve Finch asked if 16MB/s can be done with the existing cable plant. John Masiewicz answered yes - with the qualification that the cable may have to be shorter than 18" and slew rate has to be controlled. Tom Hanan further suggested that the bridge should tie IOCS16 low and that series resistors should be used (on the host) on the strobe signals. Each of these items have been covered in this group before and there has been general agreement on these.

John Masiewicz brought up the issue of mixing of slow and fast drives on a cable. Tom Hanan agreed to write an implementor's note on this subject.

7. The meeting was adjourned at 3:00 PM.