

**Accredited Standards Committee\***  
**INCITS, National Committee for Information Technology Standards**

Doc. No.: T13/E04042R0  
 Date: 12/03/2004  
 Project: 1701DT  
 Ref. Doc.: e04017r0, dt1701r3  
 d04038r0, e04158r0  
 Reply to: Dan Colegrove

To: Membership of T13

Subject: Results of letter ballot E04038R0

For the ballot to forward Draft Technical Report 1701DT, SMART Command Transport (SCT), to INCITS for further processing, the vote was as follows:

When the ballot was issued on 1 November 2004, twenty-one voting member organizations existed. The results of the letter ballot are 15 yes votes, 5 no votes, 0 abstaining votes, 1 ballot not returned. The motion passes. Details of the vote appear below.

Name	Company	Vote	Comments
Phil Gardner	Absolute Software	Yes	No
Larry Barras	Apple Computer	Yes	No
Kenneth Hirata	Emulex	Yes	No
Sumit Puri	Fujitsu	Yes	No
Dan Colegrove	Hitachi GST	No	Yes
Steve Livaccari	IBM	Yes	No
Robert Strong	Intel	No	Yes
Tim Thompson	LSI Logic	Yes	No
Mark Evans	Maxtor	Yes	No
Nathan Obr	Microsoft	Yes	No
Conrad Maxwell	Net Cell	Yes	No
Mark Overby	nVidia	Yes	No
Stefan Thurnhofer	Pacific Digital	Yes	No
Karen Zelenko	Phoenix Technologies	-	-
Greg Elkins	Qlogic	Yes	No
Joe Chen	Samsung	No	Yes
Jim Hatfield	Seagate	No	Yes
Raymond Liu	Silicon Image	Yes	No
Glenn Lott	ST Microelectronics	Yes	No
Yutaka Arakawa	Toshiba	No	Yes
John Masiewicz	Western Digital	Yes	No

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INCITS Secretariat: Information Technology Industries Council (ITI)

1250 Eye Street, N.W., Suite 200, Washington, DC 20005-3922; Fax: (202) 638-4922 Tel: (202) 737-8888

The comments are listed below. Phoenix Technologies did not vote.

Regards,

Dan Colegrove  
T13 Chairman

Comments:

Hitachi #1

The Table 11 SCT Status Response data field 0, Format Version, should be rolled to 0003 in the final draft as there may be interim implementations that supported earlier drafts.

Hitachi#2

The technical report should state what length to report for logs E0 and E1 in the Log Directory (Log 0).

Hitachi #3

Does the drive have to retain the state of Write Cache Enable set features while Feature Control code 0001h values 0002h and 0003h are set. Does the drive have to go back to the Set Features setting established before the Feature Control was issued?

Hitachi #4

SMART commands are permitted when the drive is locked. The Long Sector Access function and the LBA Segment Access function should not be permitted when the drive is password locked. Long Sector Access completely invalidates the password system if it is permitted when the drive is locked.

Hitachi #5

If Sector Count is not set to 1 what error code is returned?

Hitachi #6

There is no description of the previous registers for command responses or error responses. There should be a statement that all previous registers are reserved in GPL responses and error responses.

Hitachi #7

SCT should state that the Error Recovery Time Limit does not apply to streaming commands.

Hitachi #8

There is no error code for Invalid Function Code in SCT Data Table command.

Hitachi #9

Are read long ECC bytes returned like the legacy ECC command with one byte of ECC per word or are there two bytes of ECC in each word, like normal data?

Hitachi #10

The setting for Time Interval for temperature data tables can be set to be volatile, reverting to initial conditions on POR. This results in a problem that the data tables may have been recorded at one

sampling interval before POR and then at a different rate after POR. There is no way to determine the current interval setting. The interval setting should always be preserved over POR.

Intel #1

Section 4.5 – The entire section does not clearly or adequately describe this new behavior in such a way that host software developers can predictably develop code to support the SCT feature.

Intel #2

Section 4.5.1.3 and 4.5.1.4 provide the important host/device side behavioral aspects of this proposal; however, the readability of these sections is poor and requires reformatting as well as the inclusion of flow charts and/or host/device side state machine diagrams. Specifically, clarify interaction of data transfers and status polling by host.

Samsung #1

Comments documented as markups to the draft. See Document e04158r0-Samsung\_SCT\_comments.doc

Seagate #1-#36

Seagate Technology's opinion is that even revision 3 of the SCT technical report still contains too many cases where the definition of behavior is too vague for someone to just take the document and create an implementation that is both compliant with this document and consistent with other implementations. This applies to both the host and the device perspectives.

Revision 3 is definitely not ready to be given to INCITS for publication.

With each successive revision, beneficial clarifications have been added, but (at the same time) new instances of vagueness have been inserted. Sometimes, a prior clarification has been accidentally removed.

Since revision 3 was proposed to be the version sent to INCITS, a more thorough review involving additional staff was done. Some people read the document for the first time. This resulted in some comments that might have been reported earlier, but were not.

After the following issues have been resolved satisfactorily, and after a new revision has been published and reviewed, Seagate may be willing to reconsider its vote.

Many of the items below are minor and are not a barrier to submission to INCITS. I have made **BOLD** the items that I consider need the most work.

Item	Page	Paragraph	Section	Comments
1	n/a		Change history	Revision '2b' should be '3'
2	iv	other ad hoc participants	Foreward	'on-member' should be 'non-member'
3	3	1	3	Please insert a paragraph explicitly stating that SCT does not require the SMART feature set to be enabled.
4	3		Figure 1	There are decision 'diamonds' that have three outputs instead of the standard two.
5	3		Figure 1	<b>This does not show the use of READ LOG EXT and WRITE LOG EXT</b>
6	4	2	4	This paragraph should be split because several separate topics are mentioned. These are key assumptions and need to be highlighted as such.  <b>In fact, please consider moving this information to the <u>beginning</u> of the document.</b>
7	4	2	4	<b>Please mention that some of the processing is done before BSY is cleared (e.g. 'captive mode') and that some processing of some commands is performed 'in the background' (e.g. 'offline mode'), and that the 'background' work is not subject to controls by DeviceSelfTest or any other means other than SCT itself.</b>
8	4		Table 1	<b>Some bits of word 206 of IDENTIFY DEVICE should be set aside and marked 'vendor-specific'.</b>
9	7	code 0008h	Table 6	"Background SCT command was aborted interrupting host command"  Please insert "because of an" after the word "aborted".

Item	Page	Paragraph	Section	Comments
10	7	code 0009h	Table 6	<p>“Background SCT command was terminated because of unrecoverable servo error”</p> <p>Please remove the word ‘servo’, as it is too restrictive and there is no other defined error code to use for general read/write errors.</p>
11	8	2	4.4	<p>“BSY=0 and DRDY=1 and DRQ=0” is a PATA-ism. Consider stating, instead, “any time that the host is allowed to send a command to the device”.</p>
12	10	‘Byte’ column for all fields	Table 11	<p>Instead of saying just ‘byte 0’, say ‘Bytes 0-1’ (for a word), or ‘6-9’ for a Dword, etc.</p> <p>(or) ‘1:0’ or ‘9:6’</p> <p>Some readers see this as inconsistent with other documentation. (e.g. ATA/ATAPI-7, table 16 IDENTIFY DEVICE Information)</p>
13	10	field “Status Flags”, bit 0	Table 11	<p><b>If write cache is enabled, and the host writes to any LBA, must the DriveZeroed bit be saved IMMEDIATELY in non-volatile storage ? Must it be readable from non-volatile storage if power is lost before the data can be flushed to the media ?</b></p>
14	10	(all reserved fields in Table 11)	Table 11	<p><b>The ‘description’ of reserved fields is inconsistent. SHALL all reserved fields be zeroed ? or may they merely be considered ‘invalid’ and can contain any value ?</b></p>
15	10	bytes 11, 12-13	Table 11	<p>Consider consolidating these adjacent reserved bytes.</p>
16	10	Action Code, Function Code	Table 11	<p><b>Please clarify whether or not these fields should be cleared to zeros on completion of the last SCT command.</b></p>
17	11	bytes 205, 206-479	Table 11	<p>Consider consolidating these adjacent reserved bytes.</p>
18	13	1	4.8	<p><b>Since this section states some very basic assumptions, it should be moved to section 1.</b></p>

Item	Page	Paragraph	Section	Comments
19	13	1	4.8	The paragraph already says 'any reset'. It is redundant to list the resets separately. Also, COMRESET was omitted from the list.
20	13	1	4.8	<b>Please indicate the expected values of 'SCT Status' response fields after a reset.</b>
22	13		Table 14	Please reformat this as the other tables which describe data. In particular, insert a column which describes the offset (in bytes) from the beginning of the data area.
23	14	1	5.1	<p><b>The description of the Long Sector Access command is completely vague.</b></p> <p><b>It says "The function of this action is similar to the ATA READ/WRITE LONG capability."</b></p> <p><b>In what ways is it DIFFERENT ?</b></p> <p><b>How about importing some description from the obsoleted READ LONG and WRITE LONG commands from ATA-3 or from SCSI SBC-3 ?</b></p> <p><b>What about interactions with previously cached data ?</b></p> <p><b>The description does not say that (for WRITE LONG) the device is supposed to replace the actual ECC/CRC bytes with the data supplied by the host. It doesn't say WHAT to do with ANY of the data.</b></p> <p><b>In short, this section needs MAJOR clarification.</b></p>
24	15	ECC field	Table 16	<p>Currently says that size 'Depends on actual sector size'.</p> <p>Please change this to 'Vendor-specific'.</p>
25	15	ECC field	Table 16	<p><b>Is there any way for the device to report to the host what the size of the ECC field is ?</b></p> <p><b>The info was removed from SET FEATURES in ATA/ATAPI-4. (44h and BBh)</b></p>

Item	Page	Paragraph	Section	Comments
26	16	2	5.2	<b>If a command terminates the SCT command in process, does the incoming command also get aborted ?</b>
27	16	4	5.2	<p><b>“If the command writes all the user addressable sectors and completes ...”</b></p> <p><b>Please clarify:</b></p> <ol style="list-style-type: none"> <li><b>1. does this mean that the DriveZeroed flag may only be set if the starting LBA is zero ?</b></li> <li><b>2. or can this be taken to mean that ‘all the SELECTED sectors’ have been zeroed ?</b></li> <li><b>3. or must/may the flag be set on successful completion of ANY range of LBAs ?</b></li> </ol>
28	16	4	5.2	<p><b>“A write to any sector on the drive...”</b></p> <p><b>Should this be “A write to any user addressable sector ...” ?</b></p> <p><b>If the drive is subsequently unlocked, should writing to the HPA cause the DriveZeroed flag to be NOT cleared ?</b></p>
29	16	4	5.2	<p><b>“A write to any sector on the drive ...”</b></p> <p>Should a read to any user addressable sector also clear the DriveZeroed flag ?</p> <p><b>What if the read failed ?</b></p> <p><b>What if OfflineScan / DeviceSelfTest runs and cannot recover the data ?</b></p>
30	17	(all)	5.3	There are several places that ‘relocate’ is used instead of ‘reallocate’.
31	17	5	5.3	<p><b>“... when encountering servo defects.”</b></p> <p>Please remove the word ‘servo’, as there are other conditions which may cause the same delays.</p>

Item	Page	Paragraph	Section	Comments
32	17	6	5.3	<p><b>Please explicitly state that if write caching is enabled, that the timer limit does not apply.</b></p> <p><b>(or) Make this statement in the last paragraph of page 16.</b></p>
33	20	(just above Table 18)	5.5	Move the statement about accuracy, etc. of the temperature sensor to somewhere more visible. In this position, it gets lost in the visual noise of the tables.
34	21	Sampling Period	Table 19	<p><b>Please restore the comment about performance from the Relative Temperature table of revision 2A:</b></p> <p><b>“This period takes precedence over new read/write operations, but does not interrupt operations in process.”</b></p>
35	22	Queue Buffer	Table 19	<p><b>“The Sampling Period separates all samples in time.”</b></p> <p><b>Please change this to indicate that the ACTUAL time between samples may vary because commands may not be interrupted, but that this the MINIMUM time between samples.</b></p>
36	(none)	n/a	n/a	<p>Please consider whether <u>any</u> of SCT <i>should be</i> affected by SATA software settings preservation.</p> <p>Of course, that is outside the scope of T13, but the concept needs to be considered.</p>

Toshiba #1

Toshiba’s policy for ATA Drive is that it must be simple. We believe that it is not good direction to expand more SMART functions than now.