

Voting Results on T10 Letter Ballot 99-015r0 on
Forwarding SPI-3 to first public review

Organization	Name	S	Vote	Add'l Info
Adaptec, Inc.	lawrence lamers	P	Yes	
Advansys	Robert Frey	P	YesC	Cmnts
AMP, Inc.	Charles Brill	P	Yes	
Amphenol Interconnect	BILL MABLE	P	No	Cmnts
Ancot Corp.	Bart Raudebaugh	P	Yes	
Andataco	Gregg Neely	P	Yes	
Apple Computer			DNV	
Berg Electronics	Douglas Wagner	P	Yes	
BREA Technologies, Inc.	Bill Galloway	P	No	Cmnts
Circuit Assembly Corp.	Ian Morrell	P	No	Cmnts
CMD Technology	Edward Haske	P	Yes	
Compaq Computer Corp.	Bill Ham	A	No	Cmnts
Crossroads Systems, Inc.	Neil T. Wanamaker	P	YesC	Cmnts
Dallas Semiconductor	Charles Tashbook	P	Yes	
Dell Computer			DNV	
Distributed Processing Tech.	Roger Cummings	P	Yes	
ENDL	I D Allan	P	Yes	
Fujitsu	Eugene Lew	P	Yes	
General Dynamics	Nathan Hastad	P	Yes	
Hewlett Packard Co.	J. R. Sims, III	P	Yes	
Hitachi Cable Manchester, Inc	Zane Daggett	P	No	Cmnts
Hitachi Storage Products	Anthony Yang	P	Yes	
Honda Connectors	Thomas J. Kulesza	P	Yes	
IBM Corp.	George Penokie	P	Yes	
Iomega Corp.	Tim Bradshaw	P	Yes	
KnowledgeTek, Inc.	Dennis P. Moore	P	Yes	
Linfinity Micro	Louis Grantham	P	Yes	
LSI Logic Corp.	John Lohmeyer	P	Yes	
Madison Cable Corp.	Jie Fan	P	No	Cmnts
Maxtor Corp.	Pete McLean	P	Yes	
Molex Inc.	Joe Dambach	P	Yes	
Mylex Corp.			DNV	
Ophidian Designs	Edward A. Gardner	P	Abs	IV Cmnts
Panasonic Technologies, Inc	Han Zou	P	Yes	
Philips Electronics	Bill McFerrin	P	Yes	
QLogic Corp.	Skip Jones	P	Yes	
Quantum Corp.	Mark Evans	P	YesC	Cmnts
Seagate Technology	Gene E. Milligan	P	No	IV Cmnts
Storage Technology Corp.	Erich Oetting	P	Yes	
Sun Microsystems Computer Co	Robert Snively	P	Yes	
Texas Instruments	Robert Morris	P	Yes	
Toshiba America Elec. Comp.	Tasuku Kasebayashi	P	Yes	
UNISYS Corporation	Ken Hallam	P	Yes	
Unitrode Corporation	Paul D. Aloisi	P	YesC	Cmnts
Western Digital Corporation	Jeffrey L. Williams	P	Yes	

Key:

P Voter indicated he/she is principal member
A Voter indicated he/she is alternate member
O Voter indicated he/she is observer member
? Voter indicated he/she is not member or does not know status
YesC Yes with comments vote
Abs Abstain vote
DNV Organization did not vote
IV Individual vote (not organizational vote)
Cmnts Comments were included with ballot
NoCmnts No comments were included with a vote that requires comments
DUP Duplicate ballot (last ballot received from org. is counted)
PSWD The password was not correct (vote not counted)
ORG? Organization is not voting member of T10 (vote not counted)

Ballot totals:

34 Yes
7 No
1 Abstain
3 Organization(s) did not vote
45 Total voting organizations
12 Ballot(s) included comments

This 2/3rds majority ballot passed.

Comments attached to YesC ballot from Robert Frey of
Advansys:

Comment #1: Recommend additional information units phase sequence figure

The following phase diagrams are included in the current revision:
13.1 Phase sequences for physical reconnection and selection using
attention condition with information unit transfers disabled
13.2 Phase sequences for selection without using attention condition
with information unit transfers disabled
13.3 Phase sequences for selection without using attention condition/
physical reconnection with information unit transfers disabled

I recommend another phase sequence figure:

13.4 Phase sequences for selection using attention condition with
information unit transfers enabled

Without a 13.4 phase sequence figure the text of section 10.3.1.1.2 is
not represented in SPI-3 Section 13. There is value to having Section
13 include all prescribed/legal sequences, which is what I think it
is attempting to do.

Text from 10.3.1.1.2:

10.3.1 Selection
10.3.1.1 Selection using attention condition
10.3.1.1.2 Information unit transfers enabled
If information unit transfers are enabled for the connecting initiator
the target shall proceed to MESSAGE OUT phase.

Comment #2: Data group transfer wide residual reporting and restriction

Proposal A:

Add text to 4.8.2.1 that for DT DATA IN phase will state the correct
procedure for reporting wide residual and for DT DATA OUT phase require
intermediate data fields to be an even number of bytes.

Proposed wide residual reporting clarification text and restriction to be
added to 4.8.2.1 Data group transfers:

During DT DATA IN phase if the number of bytes in a data field is not
a multiple of two bytes, then after sending the pad and pCRC fields the
target device shall change to MESSAGE IN phase and send an IGNORE WIDE
RESIDUE 16.2.3 message with the NUMBER OF BYTES TO IGNORE field set to
01h.

During DT DATA OUT phase if a target requests a pCRC field prior to
the last data field of a command, the initiator shall transmit an even
number of bytes in that data field.

The first paragraph will lower the probability of incorrect initiator
and target implementations.

The second paragraph is needed because there is no mechanism defined for an initiator to indicate an intermediate wide residual to a target. A target is only able to infer a wide residual at the very end of a wide transfer transfer by recalling whether the command transfer length.

Proposal B:

Add a requirement that all intermediate data fields (pCRC interval) be a multiple of two bytes. This would be consistent with IU transfers (4.8.2.2) which require the iuCRC interval to be an even number of bytes.

Comment #3: Typo

4.7, paragraph two, 2nd sentence "2X depending on the whether" should be "2X depending on whether".

Comments attached to No ballot from BILL MABLE of Amphenol Interconnect:

John,

I was unable to get onto the reflector but the reason we are voting no pertains to the comments submitted by Bill Ham pertaining to the technical changes. I will try and get you the file name for the comments that were submitted by Bill Ham.

Regards,

Bill

Chair's Note: The referenced document is T10/99-317r0, Comments against SPI-3 rev 10 section 6 and annex E

Comments attached to No ballot from Bill Galloway of BREA Technologies, Inc.:

Comments sent separate

Chair's Note: Bill Galloway's comments are contained in T10/99-320r0

Comments attached to No ballot from Ian Morrell of Circuit Assembly Corp.:

I incorporate by reference the "comments against SPI 3 rev 10, Section 6 and Annex E.zip."

Chair's Note: The referenced document is T10/99-317r0

Comments attached to No ballot from Bill Ham of Compaq Computer Corp.:

Comments are contained in the following two documents:

The first document is titled:

Comments against SPI3 rev 10 section 6 and annex E.doc

which has been mailed to you and posted on the web site as document number 99-317r0.

The second document is titled:

CPQ 1xx SPI-3 letter ballot comments.doc.

which has been emailed to you today.

Chair's Note: This document was numbered T10/99-321r0.

The technical comments in the first document and the first three comments in the second document need to be accepted in order to change the vote to "yes".

The numbering of the comments has a gap between 64 which is the last of the first document and 100 which is the first of the second document.

I hope that providing two documents is not a great inconvenience.

Cheers, Bill

Comments attached to YesC ballot from Neil T. Wanamaker of Crossroads Systems, Inc.:

(T) 10.5.2.2.1.1., 10.5.2.2.1.2. Mandating a check condition in these cases seems a retrograde step.

Comments attached to No ballot from Zane Daggett of Hitachi Cable Manchester, Inc:

61 comments have been submitted in a document uploaded to the ftp site entitled "comments against SPI-3 rev 10 section 6 and annex E.zip". This document should serve as my reasoning for voting no on this ballot.

If this method is not acceptable please contact me at 603-661-3972. I did not paste these comments here because they include many graphics.

ZD

Chair's Note: The referenced document is T10/99-317r0.

Comments attached to No ballot from Jie Fan of Madison Cable Corp.:

The current cable performance requirements and it's related Annex should be replaced with a newer version of 99-111r7 (for cable requirements) and 98-219r6 (for Annex)-- Jie Fan

Comments attached to Abs ballot from Edward A. Gardner of
Ophidian Designs:

My reasons for abstaining are that I don't feel technically
qualified to competently evaluate SPI-3.

Comments attached to YesC ballot from Mark Evans of
Quantum Corp.:

Quantum's comments for the letter ballot to forward SPI-3, rev 10

Quantum # 1. Global

The terms "clause" and "subclause" are used in many places to reference
clauses or subclauses elsewhere in the standard. However, these terms are not
used consistently. Sometimes just the clause or subclause number to be
referenced is used. Sometimes "clause" is used where a subclause is
referenced. I think that the terms should be deleted, leaving only the number
for reference (e.g., "See x.y for...")

Quantum # 2. Global

The terms "annex X" and "Annex X" are used inconsistently throughout the
standard. I think "Annex X" is correct, but, one way or the other, they
should, at least, be consistent.

Quantum # 3. Global

The terms "cross talk", "cross-talk", and "crosstalk" are used inconsistently
throughout the standard. My dictionary says it should be "crosstalk", Word's
spellchecker likes "cross talk" and "cross-talk", but, one way or the other,
they should, at least, be consistent.

Quantum # 4. Global

The term "REQ(ACK)" - and sometimes "REQ (ACK)" - are used in many places
where I think the meaning is "REQ or ACK" or "REQ and ACK". I think the
single term should be replaced by the correct three-word phrase or defined in
3.1. If defined in 3.1, it would seem to me that then any "REQ or ACK" or
"REQ and ACK" in the document should be replaced by "REQ(ACK)".

Quantum # 5. Global

There are many instances where text in a list should be indented. These
include: page 1 (PDF page 23), 1 Scope, the list after paragraph 1; page 15
(PDF page 37), 4.3 Physical topologies...; page 21 (PDF page 43), 4.9
Protocol, the list at the bottom of the page; page 23 (PDF page 45), 5.1 SCSI
parallel..., the list near the bottom of the clause; page 46 (PDF page 68),
two places; etc.

Quantum # 6. Global

The symbols "+" and "-" are used in several places and should be replaced by
the words "plus" and "minus" because these symbols are defined as "add" and
subtract" in subclause 3.2 Symbols and abbreviations. I think it also might
work to put quotation marks around the symbols in this instance, but that
would probably also require additional entries in 3.2 - which is also okay by
me. (For examples see page 17 (PDF page 39), 4.4 Bus loading, paragraph 1,
and page 52 (PDF page 74), 6.7.1 LVD stub length and spacing).

Quantum # 7. Global

The term DATA BUS is used in many places in the document with inconsistent

meaning. The definition in 3.2 says "data bus [no caps]..." is an "...8-bit or 16-bit bus." However, on page 79 (PDF page 101), in 8.2 Signal descriptions, I/O:, for example, we find "DATA BUS [the capitalization of this term in the document is inconsistent, as well]". In this particular description I think we mean "...the data bus [as defined in 3.2], P_CRCA, and P1 (if present for a 16-bit DATA BUS)..." or "...DB(7-0, P_CRCA) or DB(7-0, P_CRCA, P1)..." On page 87 (PDF page 109), in 9.2.13 Data release delay, I think the same thing is true. I'm not sure exactly how this should be rectified, but a search needs to be performed on all forms of "data bus" and a correct definition included for each case.

Quantum # 8. Global

On page 86 (PDF page 108) 9.2.1 Arbitration delay, the phrase "arbitration has been won" is used. I can't find where in the draft standard that "winning arbitration" or "losing arbitration" are defined. I think the readers should know what these means, but I also think that these concepts are such critical elements of parallel SCSI that the conditions should be specifically defined in this document.

Quantum # 9. Global

The names of the timing values listed in tables 30, 31, and 32 are used inconsistently throughout the standard. Sometimes the first letter of each word is capitalized and sometimes not. Since these are specific, defined things, I recommend that the first letter of each word be capitalized (e.g., Bus Settle Delay) wherever used. I think this would be more clear.

Quantum # 10. Global

On page 103 (PDF page 125), 10.3.1.2 Selection without using attention condition, paragraphs 2 and 3, are the words "...an initiator...waits...before...looking..." I think this would be better stated as something like, "...waits before enabling detection..." I think a global search should be performed on "looking" and, where used as above, it should be changed.

Quantum # 11. Global

On page 103 (PDF page 125), 10.3.1.2 Selection without using attention condition In this paragraph 4, are the words "a target...shall determine that it is selected..." I think this should be something like, "A target shall be selected when..." I think a global search should be performed on "determine" and, where used as above, it should be changed.

Quantum # 12. Global

The phrases "bad parity" and "parity error" are used in many places in the document. I searched on "parity" and found no specific definition for these conditions in the document. Though the definition of these phrases should be intuitive, I think that this is such a critical element of parallel SCSI that the condition should be specifically defined in the document.

Quantum # 13. page 1 (PDF page 23), 1 Scope, paragraph 1:

There should be a colon after the "are" at the end of the first paragraph.

Quantum # 14. page 3 (PDF page 25), 2.1 Normative references, paragraph 1:

In the first sentence "...though reference in the text..." should be changed to "...though referenced in the text..."

Quantum # 15. page 4 (PDF page 26), 2.3 References under development, Note 1:

Does Global Engineering have copies of draft standards? I would have thought that folks would be referred to the T10 web site for these.

Quantum # 16. page 8 (PDF page 30), 3.1.68 physical reconnect:

In the second sentence, "A target does a physical reconnect..." should be

replaced with something like, "A target initiates a physical reconnect..."

Quantum # 17. page 8 (PDF page 30), 3.1.79, SCSI device:

"...connect the drivers..." should be replaced with, "...connect its drivers..."

Quantum # 18. page 9 (PDF page 31), 3.2 Symbols and abbreviations,

For QAS I think, "Quick Arbitrate and Selection" should be either, "Quick Arbitrate and Select" or, "Quick Arbitration and Selection".

Quantum # 19. page 10 (PDF page 32), 3.3.2 invalid:

I know it's this way in other standards, but I would change the last words from, "...as error." to, "as an error." (see also page 11 (PDF page 33), 3.3.8 reserved.)

Quantum # 20. page 10 (PDF page 32), 3.3.5 may not:

"A keyword..." should be changed to "Keywords..." or "A key phrase".

Quantum # 21. pages 17 and 18 (PDF pages 39 and 40), 4.7 Data transfers, paragraph 2:

The following sentence is cumbersome, "As a result the REQ(ACK) signals rising edge to rising edge time varies by 2X depending on the whether ST or DT transfers are enabled, however the data's transfer rate remains the same." I think this should be changed to something like, "As a result, the time from rising edge to rising edge for REQ and ACK signals for the same transfer rate is twice as long for a DT transfer as it is for an ST transfer."

Quantum # 22. page 19 (PDF page 41), 4.8 Data transfer modes, paragraph 2:

The second sentence is in error, "The 8-bit information transfer mode is used for all information transfers except DATA phases." I know this was an oversight on the editor's part, but additional information is transferred on the upper eight bits if AIP is in effect. The sentence could be changed to, "The 8-bit information transfer mode is used for all information transfers except DATA phases (except when an alternate error detection scheme for asynchronous information phases is in effect - see Annex M)."

Quantum # 23. page 42 (PDF page 64), 5.4.1 SE assignments, Table 5 - SE contact assignments - nonshielded alternative 4 connector, Note 3:

This note says, "The pins identified as being short and long only applies to the host connector and not the connector on the SCSI device. All pins on the SCSI device connector are the same length." I think the concept of "host" and

"device" used here are a carry overs from previous standards. In figure 15 in this standard (PDF page 29) the terms "device side" and "cable/backplane side" are used. I think these terms are more accurate and the note should use them, as well. (see also page 45 (PDF page 67), 5.4.2 Differential assignments, Table 8 - LVD/MSE contact assignments - nonshielded alternative 4 connector, Note 2:)

Quantum # 24. page 46 (PDF page 68), 6.1 SCSI bus interconnect overview, paragraph 3:

"The function of the interconnect is to:" should be changed to, "The functions of the interconnects are to:"

Quantum # 25. page 50 (PDF page 72), 6.1.3.10 Crosstalk, paragraph 2:

The terms "DATA" and "PARITY" are introduced in this paragraph with no previous explanation. The previous instance of "DATA" used by itself in this standard referred to a phase. I think most of us understand what is meant here, but that it would be more consistent (and correct) to say something like, "...DB(7-0, P_CRCA) or DB(7-0, P_CRCA, P1), and REQ or ACK pairs."

Quantum # 26. page 59 (PDF page 81), Table 19 - SE input voltage characteristics:

"VIL", VIH", "IIL", and "IIH" need to have their second two letters be subscripts in three places in this table.

Quantum # 27. beginning on page 64 (PDF page 86), 7.3.2 LVD driver characteristics and on several pages following:

I think the terms "+signal" and "-signal", and "+Signal" and "-Signal" should be replaced with the terms "+SIGNAL" and "-SIGNAL" to be consistent. (See also page 80 (PDF page 102), 7.3.2 LVD signals, several places: The document should be searched for other occurrences of this.)

Quantum # 28. beginning on page 64 (PDF page 86), 7.3.2 LVD driver characteristics and on several pages following:

The terms "source x" are used in several places in these clauses. This might be clearer if they were capitalized to be "SOURCE x".

Quantum # 29. page 68 (PDF page 90), 7.3.4.1 Management of LVD release glitches, paragraph 1:

The term "bus settle delay" (that I think should be "Bus Settle Delay") is used for the first time in the document without definition or reference. I would add "(see 9)" after the first time the term is used. Since this is also

true for "system deskew delay" (that I think should be "System Deskew Delay") on page 69 (PDF page 91), Table 24 - Glitch management requirements and other timings, I would recommend that some words be added early in clause 7 that say

something like, "For specific timing definitions see 9."

Quantum # 30. page 69 (PDF page 91), Table 24 - Glitch management requirements..., Note:

The phrase, "BUS FREE phase starts a Bus Settle Delay after..." should be changed to "A BUS FREE phase starts one Bus Settle Delay after..."

Quantum # 31. page 75 (PDF page 97), 7.4.2 LVD/MSE multimode transceiver..., paragraph 4:

The phrase, "A LVD/MSE multimode SCSI device..." should be replaced by, "An LVD/MSE multimode SCSI device..." Strangely enough, I searched the whole document, and this is the only occurrence of this.

Quantum # 32. page 76 (PDF page 98), 7.4.3 Transceiver ground drivers, paragraph 1:

The phrase, "...a MSE driver..." should be replaced by, "An MSE driver..." Once again I searched the whole document, and this is the only occurrence of this.

Quantum # 33. page 78 (PDF page 100), 8.2 Signal descriptions, C/D:
I don't think the second "CONTROL" should be all caps.

Quantum # 34. page 79 (PDF page 101), 8.2 Signal descriptions, P_CRCA (data group transfer enabled):

The term "ULP" is used for the first time here without definition. There are several ways to resolve this, but I think the best would be to add, "(ULP)" after, "upper level protocol" in 3.1.98.

Quantum # 35. page 98 (PDF page 120), 10 SCSI bus phases, paragraph 1:

It says here, "There are eight distinct phases..." (and then the distinct phases are listed). However, later in this clause we find the "NORMAL ARBITRATION phase", "QAS phase", "DT DATA IN phase", "DT DATA OUT phase", "ST DATA IN phase", and "DT DATA OUT" phase. Are these indistinct phases? Somehow I think this needs to be resolved and reconciled in throughout document.

Quantum # 36. beginning at page 98 (PDF page 120):

There are many places where the phrase, "...a [xxx time]..." where [xxx time] is Bus Clear Delay, Bus Settle Delay, etc. I think these should be changed to

"...one [xxx time]..." to be more precise.

Quantum # 37. page 98 (PDF page 120), 10.1.1 Unexpected and expected bus free: I think it is confusing to mix these conditions in a single subclause. It would be easier for me to read and understand if all of the text related to an

expected bus free condition was in 10.1.1 and the text about unexpected bus free was in a new subclause, 10.1.2. This would also, then, make two subclauses instead of one nested under 10.1 which is a more common style.

Quantum # 38. page 99 (PDF page 121), 10.2 Arbitration, paragraph 2: There is a semicolon in the first sentence that I think should be a colon.

Quantum # 39. page 99 (PDF page 121), 10.2.1 NORMAL ARBITRATION phase, first list:

Item (c) says, "...the SCSI device shall not arbitrate (i.e. assert the BSY signal and its SCSI ID) if more than a bus set delay has passed since the BUS FREE phase was last observed." However, Note 23 immediately following says, "There is no maximum delay before asserting the BSY signal and the SCSI ID following the bus free delay in step (b)." I may be missing something, but this looks like a contradiction to me.

Quantum # 40. page 108 (PDF page 130), 10.5.2.2.1 Information unit transfer, first item in the third numbered list on the page: I think that, "Shall after detecting a REQ transition;" should be changed to, "Shall wait until detecting a REQ transition;" (See also the first item in the third numbered list on page 110 (PDF page 132)).

Quantum # 41. page 111 (PDF page 131), 10.5.2.2.2.2 Data Group Pad field and pCRC field transfer to target:

The first sentence of the first paragraph is not a complete sentence (i.e., "If the I/O signal is false (transfer to the target) and the initiator determines the data field transfer is complete by detecting an assertion of the P_CRCA signal.") I think the "and" in the sentence should be removed.

Quantum # 42. page 143 (PDF page 165), 16.1.2.2 Two-byte messages:

The first sentence of this says, "Two-byte messages consist of two consecutive

bytes transferred during two consecutive MESSAGE IN phases or two consecutive MESSAGE OUT phases." but 16.1.1 says, "...a message shall not be split between

multiple MESSAGE phases." I think the sentence in 16.1.2.2 should be changed to, "Two-byte messages consist of two consecutive bytes transferred during a MESSAGE IN phase or a MESSAGE OUT phase." (See also the first sentence in 16.1.2.3 Extended messages.)

Quantum # 43. Annex E:

All of the figures in this Annex (except E.6) are at least somewhat blurry (they look even worse in my printed version of the PDF). Is there anything that can be done about this?

Quantum # 44. Annex M, M.1, paragraphs 1 and 2:

Paragraphs 1 and 2 are identical. Even though I like to see my words in print, one of these paragraphs should be deleted.

Comments attached to No ballot from Gene E. Milligan of Seagate Technology:

As you probably can see from the introduction below I am prepared to change my vote to Yes when T10 has approved the resolution of comments. This however is not a conditional vote that I think is prohibited.

Chair's Note: Gene Milligan's comments are contained in T10/99-322r0

Comments attached to YesC ballot from Paul D. Aloisi of Unitrode Corporation:

The cable information in section 6 needs to be updated to 99-111r7 and the annex e to the latest version of 98-219

***** End of Ballot Report *****