P1394b Ballot Response Actions Table (BRAT)
(as of 20SEP00)

Pending (unresolved or not yet in draft) issues

Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
1		Colin Whitby-Strevens	This document contains one or more characters in symbol font, which is not available on my PC. I may therefore be missing something.	1	E	MB	Accepted Review FrameMaker source to eliminate inclusion of nonstandard font.
1		MDJTeener	Editorial: Since 1212-1991 has known errors, we should refer to either 1212r-2000 (hopefully), or the improved ISO version	2	E	PJ	Accepted Change references to IEEE P1212, Draft 1.0, October 18, 1999. Include a note to the IEEE editor that the citation should be updated to IEEE Std 1212-200x if the standard has been approved prior to publication of P1394b.
1		MDJTeener	This document is missing a section to explain a relatively subtle point: the Link operations must be redone a bit to make use of the new services defined by this specification. Indeed, even the bus management services need to be enhanced since new speeds and error reporting is now possible. I suggest two new sections: Link enhancements, and Serial bus management enhancements.	3	T		Tentatively rejected Balloter did not provide text for proposed changes.
1		Gene Milligan	There are a humongous number of “musts” in the standard, seventy-six. “Must” is not a key word and consequently the compliance characteristic is not clear. Personally I view “must” as set by God and consequently the engineer does not need to do anything to achieve “must”. The engineer works on “shall”. Suggested Remedy = Replace the “musts” with a “shall” construction.	5	E	All	Accepted Expunge “must” from the draft.
3	5+	Gene Milligan	Why is the introduction incomplete at least regarding the portion unique to 1394b. SuggestedRemedy = Complete it.	8	E	?	Accepted. Need someone to write an introduction.
5		MDJTeener	Ed: capitalize	10	E	EH	Accepted
21		Peter Johansson	The index to C functions and procedures is a nice idea---I hope the IEEE's electronic publishing formats permit its retention with the hyperlinks. But in any case, the index should be located at the end of the document.	11	E	EH	Accepted Move index to the end; IEEE probably can’t handle hyperlinks.

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21		Gene Milligan	In the Index of C-code functions it is not clear what the alphabet t is for. Suggested Remedy = Make it clear.	13	E	EH	Accepted The function return type is stripped from the index in the hopes that the association is clear with the letters of the alphabet.
25		Peter Johansson	The scope makes no mention of the detection of physical loops in the bus topology and their subsequent resolution by selective disabling of PHY port(s).	14	T	EH	Accepted A revised PAR is to be submitted to NesCom.
25		Peter Johansson	Bilingual IO is an imprecise, obscure---and maybe even wrong---characterization. If what is meant is that the same circuits may be used to transmit EITHER data/strobe signals or 8B10B encoded signals, it should say so.	15	T	EH	Accepted
25		MDJTeener	and long distance (up to 100m)	17	E	EH	Accepted
25		MDJTeener	This section needs considerable elaboration to make the document more useful by a first time reader. In particular, it should include: 1) An overall description of the "sections of technical specifications" and their relationship to each other and the "application annexes". 2) A list of what sections in 1394-1995 and 1394a-2000 are superseded by this document (primarily the PHY sections, but also my proposed new "link operation enhancements.	18	T	DRW	Rejected The balloter should inspect the revised PAR (scope and purpose) and see if it meets his requirements.
25		Steven R Bard	S. Bard: Title, Draft page 25, line 12: "Supplement" should be "Amendment" (here and throughout the draft as appropriate).	19	E	EH	Accepted (in principle) Revisions to the PAR render the requested changes moot.
25		Gene Milligan	IEEE Std 1394-1995 (1394-1995) and IEEE Std 1394a-2000 (1394a) looks odd. Suggested Remedy = Delete (1394-1995) and (1394a).	21	E	EH	Accepted
26	20	Clay E Hudgins	Scratch "to the indication."	23	E	EH	Accepted
26		Clay E Hudgins	Figure 1-1 does not seem to agree with the definitions of 1.1 a-d. 1.1 a-d refers to a Higher Layer and a Lower Layer. In contrast, Figure 1-1 is build around the notion of a Requestor Layer and a Responder Layer. In the text 1.1 a-d, both the Request and Response are performed by the Higher Layer. In the figure 1-1, the Request and Response are performed by different layers. So, it seems to me that the figure and the text contradict each other.	24	T	PJ	Accepted

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26		MDJTeener	I think this should be ANSI Y14.5 1994, but check with John Lopata and Max Bassler.	25	T	EH	Accepted
27	10 - 11	Clay E Hudgins	"terms established in previous IEEE bus standards" please mention at least one such standard by name or number.	26	E	EH	Accepted
28		Peter Johansson	Clause 1.5.8 should reference ISO/IEC 9899:1990. (or a more recent revision, if one is available) as the authoritative source of C code definitions.	28	T	EH	Accepted
28	37	Brian Batchelder	I think it would be more correct to say "most-significant-bit-first" or "this means that the most significant bit of each field defined in this standard is sent first."	29	E	EH	Accepted
29		MDJTeener	I think this text is obsolete.	30	?	EH	Accepted
29	10	Steven R Bard	"I -- J" should it not be "I == J"?	31	E	EH	Not applicable The text is correct in the source manuscript but displays in error in the PDF version.
29	39 - 42	Brian Batchelder	I suggest that lines 39-42 be moved so they are on the same page with lines 1-14 of page 30.	32	E	EH	Accepted
30		Colin Whitby-Strevens	wait_time	33	E	EH	Accepted
30		Colin Whitby-Strevens	grammatical error - I suggest " . . . define a construct which contains a number of components which execute in parallel.	34	E	EH	Accepted
30		Brian Batchelder	Line 1: remove second "which"	35	E	EH	Accepted
32		Clay E Hudgins	p. 32, line 3. "generic meanings." ge·ner·ic (j-nrk) adj. Abbr. gen. Relating to or descriptive of an entire group or class; general. Do you mean these definitions have the same meaning for all CSRs in P1394b? If so, use of the term "generic" is probably correct, but the term is so closely associated with lack of branding (e.g., generic soap), that I recommend another wording, such as "have the same meaning for all CSRs in this standard".	36	T	EH	Accepted
32		Clay E Hudgins	p. 32, line 3, 17, and 26. The term "generic" is used only three times in this standard. May I suggest the document would have a more professional tone if you could somehow eliminate the word "generic" altogether.	37	E	All	Accepted Changes made only in noted section; editors to review remainder of document.
32		Clay E Hudgins	p. 32, line 40. "41 Although reads of WO registers and writes of RO registers are not expected, the register definition still defines their results." Good Job!	38	E	EH	Accepted Thank you.

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32		Clay E Hudgins	p. 32, line 2. “their function should not be inferred solely from their names.” I believe you mean “shall not” instead of “should not,” given your formal definition of should versus shall.	39	E	EH	Accepted
32		Brian Batchelder	Line 14: What does “its” refer to? Would it be more accurate to say “the” or “the node's”?	40	E	EH	Accepted
32		Brian Batchelder	Line 22: Wouldn't it be more accurate to say “last written”? “Previously” seems to be too vague.	41	E	EH	Accepted
33	42-44	Gene Milligan	It is not clear if 1.5.13 is meant to cover all instances for precedence in case of conflicts or not. But the precedence for tables and figures should be added. Suggested Remedy = Add a full precedence statement.	42	E		
35		Peter Johansson	The reference citations are incomplete and there is no information about how to obtain them.	43	E	EH	Accepted
35		John N Fuller	This appears to be a typo.	44	E	EH	Accepted
35		MDJTeener	Editorial: the names of the references, not just the numbers, should be included.	45	E	EH	Accepted
35		Steven R Bard	Page 35, Line 4 “…the revision shall apply.” I'm concerned whether this is good practice. There may be an occurrence that a later revision of a publication may eliminate a feature or function (or even alter a feature or function) that makes this standard non-functional with regard to the newer revision. I suggest the words “When the following publications are superseded by an approved revision, the revision shall apply.” be removed from this draft. It is sufficient to say this standard is used in conjunction with the list of publications (and their revisions as cited).	46	T	PJ	Accepted See P1212 for reference language.
35		Peter Johansson	The reference citations are incomplete and there is no information about how to obtain them.	47	T	PJ	Accepted
35	8	Gene Milligan	Reading a project authorization is not very helpful <<ANSI NCITS T11.2/Project 1230/Rev 10 (June 1999 or later revision)>> Suggested Remedy = Add the title of the draft that is being referred to.	48	E	EH	Accepted
35	6	Gene Milligan	A source for obtaining AF-PHY-0015.000 (ATM Physical Medium Dependent Interface Specification for 155 Mb/s over Twisted Pair Cable would be helpful. Suggested Remedy = Add it.	49	E	EH	Accepted
36	7	Steven R Bard	A reference to IEEE Std 1394a-2000, Amendment to IEEE Std 1394-1995 must be added	50	E	EH	Accepted

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38		Clay E Hudgins	p. 38, line 21. It appears that each instance of “B” means Beta. If that is so, I recommend that you spell out “Beta” within the definition rather than use “B” within the definition.	56	E	DRW	Each instance of "B" does not mean Beta. A "B" cloud includes things that are not using 8B/10B (like a B PHY-link interface).
43	53	Gene Milligan	<<plug present: There is a plug present at the local end. It does not imply an end-to-end connection.>> Present is a well known word defined in all dictionaries. Plug is the word that needs definition. Suggested Remedy = Define it.	64	E	DRW	Removed "plug present" from the glossary.
47		Colin Whitby-Strevens	No, they're border nodes. Bilingual is reserved for describing ports	69		MJT	
47		Colin Whitby-Strevens	More text needs to go here, to explain what a Beta mode port is, what a DS mode port is, what a bilingual port is, what a B node is, what a border node is, what a B bus is, what a hybrid bus is, and to point out that a B node is compliant with this spec (a node is not required to have Legacy ports or link) and that a border node is compliant with this spec (it may have no bilingual ports).	70		MJT	
47	23 - 24	Clay E Hudgins	This is the first time you use “PHY” other than the Scope or definitions section. I recommend you elaborate here on what you mean by “PHY”.	71		MJT	
47		MDJTeener	Difference between bilingual PHYs and ports is unclear here.	72		MJT	
47		MDJTeener	The text in this clause should include references to the particular normative clauses or subclauses that implement the features described.	73		MJT	
47		David R Wooten	Arbitration should not be capitalized.	74		MJT	
47		David R Wooten	Bus should not be capitalized	75		MJT	
47		David R Wooten	This sentence (“Many of these…”) is not useful. It should be eliminated as the nodes using the speeds defined in this standard use BOSS mode which is superior to the accelerations in 1394a.	76		MJT	
47		David R Wooten	Should say “fully interoperable”.	77		MJT	
47		David R Wooten	at the signaling level. Nodes using this standard use the bilingual or Beta only connector.	78		MJT	
47		David R Wooten	New instead of “non-backward compatible”	79		MJT	
47		David R Wooten	…which support both these…	80		MJT	
47		David R Wooten	lower case “plastic optical fiber” and “glass optical fiber”	81		MJT	
47	13	Steven R Bard	Change “…6-pin IEEE…” to “… 6-pin and 4-pin IEEE”	82		MJT	

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48	3	Clay E Hudgins	Please have your IEEE editor advise on the use of the word “we” here and elsewhere in the standard. “We” shows up a few times in the annexes and is sprinkled throughout the C code. The use of “we” here seems inconsistent with the tone of the rest of the document.	83	E	All	Accepted Expunge “we”.
48		Clay E Hudgins	Figure 4-1 would benefit from arrows from the PMD block to the outside cable plant to which they connect.	84		MJT	
48	7 - 8	Clay E Hudgins	You have not yet defined Link as used here. The glossary identifies “link” as a protocol layer. I assume “Link” is your interface to your Host, whereas “PMD” is your interface to your cable plant?"	85		MJT	
48	3	Clay E Hudgins	Figure 4-1. To the uninitiated it is not at all clear which end of this diagram connects to the host, and which connects to the system cable plant. Initially, I assumed that the bottom of the diagram “PMD” connected to the system cable plant. Then, as you begin writing about the Link behavior, I began to have creeping doubts and went back to find a definition for Link in the glossary. Failing to find a relevant definition for Link in the glossary section, I tried to deduce the meaning from the context. I'll probably figure it out after I read a few more pages, but at this point you have lost me. Just thought you'd like to know.	86		MJT	
48		David R Wooten	… the master PHY architecture…	87		MJT	
48		David R Wooten	…(two twisted pairs or two optical fibers)…	88		MJT	
48		David R Wooten	I think this is actually dual simplex operation as the communications is not over the same 'wire'.	89		MJT	
48	49	Gene Milligan	<<The element(s) being covered will be highlighted with bold lines.>> Huh? Suggested Remedy = Make a statement that is clear and not based in the future.	90		MJT	
49	16	Clay E Hudgins	Re “shall not be connected to.” I think you mean “shall not be supplied with.” Otherwise, the sentence “15 Legacy DS mode connection is achieved by using a cable with the IEEE 1394-1995 connector on one side and the bilingual connector on the other side. doesn't make sense.	91		MJT	
49		MDJTeener	the IEEE 1394-1995 or 1394a-2000	92		MJT	
49		MDJTeener	IEEE 1394-1995 or IEEE 1394a-2000	93		MJT	
49		MDJTeener	… only slightly larger than the 4-circuit IEEE 1394a-2000 connector.	94		MJT	

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49		David R Wooten	… to minimize emissions.	95		MJT	
49		David R Wooten	Connection of an optical transceiver to the copper connector may be simple, but it is not supported by this standard. This should be replaced with "Thus, connecting an optical transceiver to a standard PHY is a simple matter."	96		MJT	
49		David R Wooten	Eliminate "to avoid shock and cable melting hazards." This standard makes no warranties about shock or melting hazards.	97		MJT	
49		David R Wooten	…on one end of the cable…	98		MJT	
49		David R Wooten	… end of the cable.	99		MJT	
49		David R Wooten	A bilingual or Beta-only PHY port shall not be connected to either the 4 or 6 circuits connectors defined by IEEE std 1394-1995 or IEEE std 1394a-2000	100		MJT	
49		David R Wooten	The sentence "These restrictions are necessary to avoid excessive emissions" is not needed. Besides, we don't warrant that use of the bilingual or Beta-only connector will avoid excessive emissions.	101		MJT	
49		David R Wooten	Data are transmitted…	102		MJT	
49	29	Gene Milligan	Ethernet standard is an incomplete reference. Suggested Remedy = Either reference the specific standard or delete the reference.	103	E	MJT	
49	26	Gene Milligan	<<CAT-5 UTP (ISO/IEC 11801 ch. 7)>> ISO/IEC standards do not have chapters assuming ch. stands for chapters. ISO/IEC standards have clauses. But in any case it is a bad practice to reference specific clauses in other standards since they may migrate with revisions. Suggested Remedy = Just reference ISO/IEC 11801 without specific clauses in several places.	104	E	MJT	
50	4	Clay E Hudgins	Some summarization or review of this "SXX00" (e.g., S800) notation seems appropriate here, or earlier -- at least somewhere in the document.	105		MJT	
50		MDJTeener	Editorial: there is inconsistent capitalization of "BOSS" in the document. Pick one…	106		MJT	
50		MDJTeener	change to: increases, but much more is required as the bit rates get to the gigabit range and the link distance approach 100 m. This specification adds the fundamental mechanism of "pipelined" arbitration. That is, while a node is transmitting a packet, the process of selecting the next node to transmit is also taking place. This process is outlined in the next clause.	107		MJT	
50		David R Wooten	arbitration as defined by IEEE std 1394-1995…	108		MJT	

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50		David R Wooten	… for a large bus running at S100 speeds. Eliminate the short sentence "This is for S100 bus speed."	109		MJT	
50		David R Wooten	…large data packet efficiency…	110		MJT	
50		David R Wooten	…small data packets efficiency…	111		MJT	
50		David R Wooten	…does not yield a proportional increase in throughput.	112		MJT	
50		David R Wooten	Add "This standard introduces an arbitration mechanism that increases the efficiency over that obtained by the IEEE std 1394a-2000 improvements."	113		MJT	
50		Farrell Ostler	Table 4-1 Perhaps tighten up the correspondence between the text and table nomenclature. Suggested Remedy = Change "MMF" to "GOF", since that is what is was called in the text and both POF and HPCF are called multi mode * fiber in the text. Then, also, explicitly introduce the STP and UTP5 acronyms in the text.	114	E	MJT	
50	26	Farrell Ostler	Boss vs. BOSS Suggested Remedy = "Boss mode" -> "BOSS mode", since elsewhere BOSS appears as all capitals.	115	E	MJT	
50	47 - 49	Farrell Ostler	The terms "transaction fairness" and "fairness Optimization" are not found in the 1394a-2000 spec (although they were used during WG discussions). The concepts are captured generally as "priority arbitration" (clause 4.4, 1394a), and specifically as "priority arbitration for PHY packets and response packets" (clause 10.10) and "priority budget" (clause 10.20). Further, it might be better to say "liberalized use of priority arbitration" since, of course, priority arbitration is an original 1394-1995 concept. Suggested Remedy = Eliminate current "e) Transaction fairness" and "f) Fairness optimization" and then also do one of the following - leave "d) priority arbitration" as is - rename d) to "d)Liberalized use of priority arbitration" - remove "d) Priority arbitration" and then add "d) Priority arbitration for PHY and response packets" and "e) Priority budget"	116	E	MJT	
50	51	Gene Milligan	<<The combination of all these accelerations can result in impressive bus efficiency increases.>> Impressive bus efficiency is a valueless statement. Is this a standard or a marketing flyer?	117	E	MJT	
51		MDJTeener	OK, OK, I volunteer to fix this figure to make it consistent with the nice 1394-1995 figures.	118		MJT	

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51		MDJTeener	Better wording "An example of an implicit winner of arbitration would the addressed node in a directed asynchronous packet since it must send an ACK." … or some such …	119		MJT	
51		MDJTeener	are special symbols	120		MJT	
51		David R Wooten	…between all the Beta nodes on a bus allows arbitration to be overlapped with data transmissions…	121		MJT	
51		David R Wooten	"The nominal sequence of events is:…"	122		MJT	
51		David R Wooten	… the sender of the ACK is the implicit winner of arbitration and will become the BOSS.	123		MJT	
51		Kiyoshi Miura	This sentence should be removed.	124		MJT	
51	37	Farrell Ostler	Suggest remove "Full duplex connections means that arbitration can be pipelined". If it adds meaning beyond what is in the Figure 4-2 caption, then the caption could be extended.	125	E	MJT	
52		Clay E Hudgins	replace "data lines is" with "data lines are"	126		MJT	
52	33 - 34	Clay E Hudgins	This sections effectively says that "it would be difficult to continue to the increase the transfer speeds without making the interface wider" so we made it serial. I think the logic involved requires further development.	127		MJT	
52	39 - 52	Clay E Hudgins	This says that the new serial PHY-Link interface contains a PHY in the Link. So, there is obviously a PHY in the PHY and there is also a PHY in the link. So the interface between and PHY and a Link is just an interface between a PHY and a PHY"	128		MJT	
52		MDJTeener	add a comma …	129		MJT	
52		MDJTeener	replace with "has"	130		MJT	
52		David R Wooten	Mixed capitalization in this heading needs to be fixed	131		MJT	
52		David R Wooten	"The evo	132		MJT	
52		Steven R Bard	…PHY-Link interface had been…" change to "…PHY-Link interface has been…	133		MJT	
52	42	Steven R Bard	… "nearly"? My expectation is that the Beta Port on a PIL is a completely functional Beta-mode only port and can be used to interface to another beta-mode only device. I believe the word "nearly" must be removed. Also, the word "equivalent" must be removed. Use words like: "…contains a functional Beta-mode PHY."	134		MJT	

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52	45 - 47	Steven R Bard	This text is border line misleading. It should be re-written to make MORE clear that the Beta PHY in a PIL is, in reality, a completely functional 1394b Beta-mode only PHY. The option is available, however, to scale back the design of the PIL PHY such that it is NOT a completely functional beta-mode only PHY (as what occurs when the PHY no longer participates in tree-ID).	135		MJT	
52	48	Steven R Bard	The node-ID may be shared - it is not a requirement. It is ONLY shared with the PIL Beta-mode port is configured to function as the serial PHY-Link interface"	136		MJT	
52		Farrell Ostler	Various minor grammar or typo things. Suggested Remedy = line 3: “of these is represents” -> “of these represents” line 34: “planar designs” may not be a generally used term. Presumably it refers to layout of a printed circuit board. (However, this may just reflect my ignorance.) line 41: “therefor” -> “therefore” ? line 49: “an special packet” -> “a special packet”	137		MJT	
53		Peter Johansson	If I understood what the second paragraph in clause 4.7.1 meant, then I could comment on it! Please reword to match whatever meaning was intended."	138		MJT	
53		Peter Johansson	This comment arose while reading clause 4.7.2, but it applies everywhere the terms “nephew” and “uncle” are used. Mayhap this seems niggling, but it is a stretch for me to fit “child” and “nephew” into the same category and just as difficult to group “parent” and “uncle” together. If we are going to stick with familial appellations, might “dependent” and “guardian” be better choices for these two roles?."	139		MJT	
53	21 - 22	Clay E Hudgins	Recommend you delete this sentence, or rewrite. This says that you created a new term that is synonymous with and old one, and that is somehow an improvement."	140		MJT	
53		MDJTeener	should loop be capitalized? I don't think so.	141		MJT	
53		MDJTeener	only of Beta-mode operation.	142		MJT	
53		MDJTeener	than one	143		MJT	

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53		Peter Johansson	If I understood what the second paragraph in clause 4.7.1 meant, then I could comment on it! Please reword to match whatever meaning was intended. This comment arose while reading clause 4.7.2, but it applies everywhere the terms “nephew” and “uncle” are used. Mayhap this seems niggling, but it is a stretch for me to fit “child” and “nephew” into the same category and just as difficult to group “parent” and “uncle” together. If we are going to stick with familial appellations, might “dependent” and “guardian” be better choices for these two roles?"	144		MJT	
53	18 - 22	Farrell Ostler	This clause could be clearer to the reader. Suggested Remedy = Remove the word “supported” on line 18. Rewrite the sentence that starts on line 21."	145	E	MJT	
53		Bradley Saunders	The sentence “A root node, a node with more than active port and a node that has another port already in Standby cannot be placed into a Standby state (i.e., it cannot become a nephew).” does not read right. The portion “a node with more than active port” seems wrong. Suggested Remedy = The corrected portion probably should read: “a node with more than one active port”."	146		MJT	
55		Peter Johansson	In clause 5.1, first paragraph, the phrase “… at distances up to 4.5 meters” should be deleted as it is not, strictly speaking, correct. May I not use the same connector with a longer length if I know it meets the performance criteria?	147	E	MB	Accepted Strike first sentence. In 5.2.3, modify first sentence to read “Short-haul copper cable assemblies shall be one of the three types specified by table 5-2.”
55		Peter Johansson	Spelling error in clause 5.1; “comperable” should be “comparable”."	148	E	MB	Accepted
55		Peter Johansson	In clause 5.1, what is the last sentence of the third paragraph attempting to say? It gives an impression of exclusivity, even though 1394b specifies other cables and connectors as well. Is it trying to say the cables and connectors defined by 1394-1995 and 1394a-2000 are not altered by 1394b?"	149	E	MB	Accepted Qualify references as “short-haul copper”.
55		David R Wooten	…boxes may present… Can't mandate the use of a copper connector.	150	E	MB	Accepted

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55		David R Wooten	Instead of "IEEE 1349b shall cover…" it would be better to say "This standard described the Beta and bilingual cables and their mating PCB socket interfaces.".	151	E	MB	Accepted
55		David R Wooten	It should be "bilingual" instead of "Bilingual"."	152	E	MB	Use "bilingual" (not hyphenated) throughout document. In general, it does not require capitalization.
55	25	David R Wooten	…clause shall be should be "…clause will be…"."	153	E	MB	Accepted Delete "shall"
55		Peter Johansson	In clause 5.1, first paragraph, the phrase "… at distances up to 4.5 meters" should be deleted as it is not, strictly speaking, correct. May I not use the same connector with a longer length if I know it meets the performance criteria? Spelling error in clause 5.1; "comperable" should be "comparable". In clause 5.1, what is the last sentence of the third paragraph attempting to say? It gives an impression of exclusivity, even though 1394b specifies other cables and connectors as well. Is it trying to say the cables and connectors defined by 1394-1995 and 1394a-2000 are not altered by 1394b?"	154	E	MB	Editorial comments accepted. Comment about 4.5 meter limitation rejected because the clause specifies cables by their construction, not solely by performance criteria.
55		David Brearley	Suggested modifications to the specifications for the following reasons. 1) Improve manufacturability for lower cost with adjustment of tolerances. 2) More robust keying to prevent improper plugging between Beta/Bilingual- dimensional 3) Close front wall of plug to prevent inverted mating of plug into socket 4) Definition of socket placement to the edge of the PCB 5) Editorial corrections to text Suggested Remedy = This space will not accept a chart with recommended changes. Where can I send electronically a PDF file?? Electronic ballot is great, but this form is too restrictive."	155	T	MB	Tentatively accepted New drawings required that illustrate changed tolerances and dimensions. Informal consensus with other interested parties sought before BRC makes final decision.

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
55		Gene Milligan	<<All dimensions, tolerances and descriptions of features which affect the intermateability of the Beta, Bilingual plugs and sockets are specified within this clause. Connector features which are not directly controlled within this clause shall be indirectly controlled by performance requirements in clause 5.3>> This clause is 5. 5.3 is part of clause 5. The statement makes no sense. Also it is written as a requirement to the authors not the implementers. Suggested Remedy = Change the statements to "Connector features which are not directly controlled within 5.1 are indirectly controlled by performance requirements in 5.3."	156	E	MB	Accepted
55	27	Gene Milligan	<<IEEE 1394b shall cover the Beta and Bilingual cables and their mating PCB socket interfaces.>> Who is this normative requirement directed to? It does not sound like a normative requirement that the implementer can comply to . It sounds more like it is directed to the authors of the standard. Normative requirements to be followed by the authors are of no value. Suggested Remedy = I think the statements should be made informative by changing it to "IEEE 1394b defines the Beta and Bilingual cables and their mating PCB socket interfaces."	157	E	MB	Accepted Delete offending sentence.
55	18	William A. Northey	Spelling error "directy" Suggested Remedy = change to "directly"	158	E	MB	Accepted
55	7	William A. Northey	Grammatical error "A interconnect matrix…" Suggested Remedy = should state "An interconnect matrix…"	159	E	MB	Accepted
56		David R Wooten	…details will ensure… should be "…details will help ensure…". Can't warrant that adherence will insure."	161	E	MB	Accepted
60		Peter Johansson	In clause 5.1.2, the phrase "…to maintain the high performance of the system interface" is gratuitous and has no place in a standard. There are many instances of this type of phraseology throughout the standard (too numerous to mention); in the likely event that P1394b is recirculated, I recommend that the BRC remove as many as it notices."	162	E	All	Accepted Search and destroy gratuitous phrases (except in informative sections).
71		Gene Milligan	<<It is necessary to standardize the plated finish on the shells to insure compatibility of products from different sources.>> It is not necessary to say it is necessary. Suggested Remedy = Delete this statements several places.	165	E	MB	Accepted

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
72		Peter Johansson	Clause 5.1.8 should not constitute a normative requirement. The first paragraph should read something like, "The dimensional specifications recommended for the footprint of a surface-mount printed circuit board beta socket are illustrated by figure 5-18." The same considerations apply to figure 5-19 (it should not be normative).	166	E	MB	Accepted
76		John N Fuller	IEEE Std 1394a-2000	168	E	MB	Accepted
76	39	Gene Milligan	<<Legacy cable assemblies shall use the cable referenced in IEEE Std 1394-1995 and 1394a.>> Legacy cables are specified by 1394 and/or 1394a. Why is this statement in 1394b? Suggested Remedy = Delete it.	169	E	MB	Accepted Change paragraph to "Cable assemblies may be constructed with a 4- or 6-pin connector (specified by IEEE Std 1394-1995 or IEEE Std 1394a-2000) at one end and another connector (specified by this standard) at the other. In these cases, the characteristics of the bulk cable material are governed by IEEE Std 1394-1995 or IEEE Std 1394a-2000, as appropriate."
77	28	Gene Milligan	<<This new classification of cables specified in this chapter will operate at a range of speeds based on the performance criteria set by the connectors and cables. Table 5-3 shows the various interfaces.>> Does IEEE use chapters rather than clauses? Both are used in 1394b. Suggested Remedy = Use a consistent term. Preferably the on prescribed by ISO/IEC or IEEE.	170	E	MB	Accepted
79		John N Fuller	This wire should be shown connecting to pin 6.	172	T	MB	Accepted
80		David R Wooten	Replace 1394b with "this standard".	173	E	MB	Accepted
81		David R Wooten	this should be Beta or bilingual connectors instead of 1394b	174	E	MB	Accepted

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
81	14	Gene Milligan	<<NOTE 2 —All resistance values shown in the following performance groups are for connectors only, including their terminations to the wire and/or PC board, but excluding the resistance of the wire. Resistance measurements shall be performed in an environment of temperature, pressure and humidity specified by ANSI/EIA 364-C-94.>> Normative requirements are not allowed to be buried in notes of ISO/IEC standards, ANSI standards and I suspect not in IEEE standards. Suggested Remedy = Move the normative requirement from the note to the body of the standard.	175	T	MB	Accepted
81	1 - 5	Gene Milligan	<<Accordingly, the performance groupings, sequences within each group and the test procedures shall follow the recommendations of ANSI/EIA 364-C-94, except where the unique requirements of the 1394b connector and cable assembly may call for tests which are not covered in ANSI/EIA 364-C-94 or where the requirements deviate substantially from those in that document. In those cases, test procedures of other recognized authorities or specific procedures described in the annexes will be cited.>> Once again this is a requirement for the authors. They either did it or did not. Suggested Remedy = Delete "In those cases, test procedures of other recognized authorities or specific procedures described in the annexes will be cited." Or replace it with "Test procedures are described in the annexes."	176	E	MB	Accepted
91		Peter Johansson	In clause 5.4.1.3, it should be made clear that this test fixture assumes a particular footprint, that the footprint is not normative and that the test fixture may require modification to suit a particular part's footprint.	177	T	MB	Accepted See page 72.
94	6	John N Fuller	amendment IEEE Std 1394a-2000	178	E	MB	Not applicable Clause 5.5 to be deleted in recirculated draft.
94	6	David R Wooten	IEEE std 1394a-2000	179	E	MB	
94	6	Steven R Bard	IEEE Std 1394a-2000 nomenclature should be used instead of "IEEE std 1394a"	180	E	MB	
95		John N Fuller	This sentence is confusing, delete "should be noted that it" at the beginning of line 2.	181	E	MB	
96		David R Wooten	Should say "Figure 5-37 reveals" rather than "This figure".	182	E	DRW	Accepted

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
96	5 - 30	Burke Henehan	All the component values given in figures 5-37, 5-38, 5-39, etc should be labeled as “typical”. Only where specified in a normative table or normative text should a component value be a requirement. Suggested Remedy = All component values given in figures be made “typical” or “informative”	183	T	DRW	Accepted Clearly indicate that component values in figures are nominal.
96		David K. Johnson	On page 97, Figure 5-37 is titled “Bilingual port termination example” which I believe means that this figure is informative. For example most 1394 applications will not use 250 pf capacitors since this is not a common value, instead they will choose 220 pf or 270 pf. Also the 55 ohm termination resistors may be reduced depending on the differential impedance of the transceiver. For this reason this figure should be considered informative. Figures 5-38 and 5-39 should also have “example” added to the end of the title since they should also be considered informative. Suggested Remedy = Given above."	184	T	DRW	Accepted Clarify language to describe schematics as possible implementations of the configurations shown.
97		David R Wooten	Upper case "TpBias"	185	E	DRW	Accepted
99	2	Steven R Bard	Double word “simplified” - choose one to remove"	186	E	DRW	Accepted
99	1 - 2	Steven R Bard	“PHY/FOP” reference confused me (imagine that!) I think it would be more clear if the text was written to say “the PHY or FOP electronics” The confusion is a person may think that a PHY and FOP are one and the same device when, in fact, they are two separate and distinct architectures."	187	E	DRW	Accepted
101	47	Clay E Hudgins	Figure 6-1. This figure is never referenced in the text. The figure seems to be mistitled. It does not look like a short-haul electrical PMD."	188	E	EH	Accepted
101		MDJTeener	For interfaces, we need an explicit correlation between the TP4/1 (see note for figures 6-1 and 6-2).and the C-code PMD services for both Beta and DS mode."	190	E	CWS MJT	Tentatively accepted

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
102		Colin Whitby-Strevens	300 mV for all speeds	192	T	EH	Accepted with modification. 300 mV minimum launch voltage for S800. Need 450 mV minimum launch voltage for S1600. The max voltage remains the same (800 mV for all). Note, this is the TP2 voltage which means that the TP1 voltage may have to be higher but that is out of scope. Also, note that an S1600 capable PHY can launch at 450 for both S800 and S1600.
102	28 - 46	David K. Johnson	Differential skew specification in table 6-1 is set for 25 ps, which is the same as the 802.3 1000base-X specification. Meeting this specification will be a real challenge for the 1394b bilingual PHY because of the complexity of a bilingual PHY port. Any increase would make the mass production and testing of S800 1394b devices less costly. Since 1000base-X baud rate is 25% faster than S800 it should be possible to increase this a minimum of 25%. Suggested Remedy = Given above.	195	T	EH	Accepted Increased to 35 ps.
103		David R Wooten	This note should follow figures 6-4 and 6-5.	196	E	EH	Accepted
104		Colin Whitby-Strevens	300 mV	197	T	EH	Modified See resolution of page 102 comment above
104		Colin Whitby-Strevens	-300 mV.	198	T	EH	
104	54	Clay E Hudgins	Use of the word “should” is inconsistent with its special definition in the definitions section. I recommend you choose another word.	199	E	EH	Accepted
104		David R Wooten	This note is going to cause problems for a lot of PC's that need to have 1394 connectors on the front and back. It would seem to me that if the transmit at TP2 is OK and as long as the receiver can deal with whatever happens between TP3 and TP4, that we don't have anything else to be concerned about.	200	E	EH	Accepted

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
104		David R Wooten	When are TDR times shown? Can't figure out where the transit time makes any difference.	201	E	EH	Accepted TDR is not discussed in the transmitter section. The note is deleted. However the same note appears in the receiver section where a TDR measurement is defined, that note stays.
105		David R Wooten	Lower case 'std'.	203	E	EH	Accepted
106		David R Wooten	This is gibberish.	204	E	EH	Accepted Changed to refer to the receiver bulkhead receptacle location
107		Colin Whitby-Strevens	6.5.1 Beta mode bias requirements I think this is very unclear. It seems like a chip spec. But, of course, we're specifying the connector interface. I think “in the case of DC coupling to the bias circuit of a Beta mode transmitter” means “whenever the system is engineered so that it might be possible to DC couple to a transmitter” not “to allow for the case of the system being engineered so that it might be possible to DC couple to a transmitter” which is how I first read it.	205	T	EH	Accepted. Table regrettably omitted in balloted draft has been reintroduced.
107		David R Wooten	What is an “alternating K28.5”? What is it alternated with?"	206	E	EH	Accepted There are two forms of K28.5 with alternating disparity. But I added this clarification to the text for the reader
107		David R Wooten	Capitalize “Table”	207	E	EH	Accepted
107		Steven R Bard	page 107, line 26 replace “table” with Table”	208	E	EH	Accepted
107	43	Steven R Bard	The reference to the very technical specification “high enough” leaves me wondering when I may have met or exceeded the threshold. I think we need to determine a value for the impedance of the network and include that value in the standard.	209	T	EH	Accepted
107	26	Bradley Saunders	Sentence is not properly capitalized: “table 6-4 defines …” Suggested Remedy = s/b “Table 6-4 defines …”	210	E	EH	Accepted

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
108		John N Fuller	I believe these two table entries should be: BASE_RATE * 10/8 * 0.5 which corresponds to the text in the above paragraph. Otherwise this table yields a Min greater than the Max.	211	T	EH	Accepted
108		David R Wooten	Font for “pmd_tone_on” is too small.	212	E	EH	Accepted
108		Steven R Bard	page 108 line 3 Drop the word “approximately” - a range is specified - “approximate” is, therefore, implied"	213	E	EH	Accepted
108	12	Bradley Saunders	Max frequency entry equations don't seem to match text in just previous paragraph -- BASE_RATE*8/10 versus BASE_RATE*10/8. For Connection Tone Frequency, it seems that the Min is greater than the Max: BASE_RATE*0.5 > BASE_RATE*8/10*0.5. Suggested Remedy = Correct inconsistency as needed. Adding parentheses to these equations might also be helpful for readability, e.g. (BASE_RATE*10/8)*0.5.	214	E	EH	Accepted
109		Steven R Bard	Table 6-8 “NEXT” is not in the technical glossary and I do not recall seeing it defined in the text prior to its appearance in this table.	216	E	DRW	Accepted
111		Colin Whitby-Strevens	needs rewording to include the “shall “ word, for example, “ . . . .components shall be designed so as not to exceed the limits of output jitter, and to tolerate at least the input jitter specified in the following sections.	217	T	EH	Accepted
111		Colin Whitby-Strevens	All the bold has gone!!! Perhaps it would be better to say that transmitters shall comply with DJ and TJ at TP2, and receivers with DJ, sinusoidal and TJ at TP3. Similar comments for the optical specs"	219	E	EH	Accepted
111		David R Wooten	The bold has been lost.	220	E	EH	Accepted
111		Kiyoshi Miura	Bold values are not found in the following tables of 6-9 to 1-15.	221	E	EH	Accepted

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
113	48	Clay E Hudgins	Figure 7-1 is never referenced in the text. The figure seems to be mistitled. It does not look like a sketch of a Glass optical fiber PMD.	222	E	MJT EH MS	Accepted Figures are to be uniformly titled "PHY Master architecture (xxx PMD in context)". PMD boxes in individual PMD chapters to name only the relevant. PMD. Include in first paragraph, "Figure x-1 shows the relationship of this clause to the PHY master architecture."
117	8	Colin Whitby-Strevens	All the bold has gone! See similar comment in electrical section	223	E	MS	Accepted
117	8	David R Wooten	The 'bold' has been lost.	224	E	MS	Accepted
117	8	Kiyoshi Miura	As well as in part of short copper cable, no bold values are found.	225	E	MS	Accepted
125	44	Clay E Hudgins	Figure 8-1 is never reference in the text and appears to be mistitled. It does not look like a sketch of a plastic optical fiber PMD.	227	E	MS	Accepted See resolution for figure 7-1.
125	1	MDJTeener	The text in this clause should be made consistent with the text in clause 7 (Glass optical fiber)…	228	T	MB VT	Deferred Need accurate technical assessment of clause 8. "Owners" to recruit assistance.
125	1	Kiyoshi Miura	POF and UTP specifications should be removed since 1) POF can be still considered as emerging technology so that it is better to leave for future standardization activity. 2) Through 1995 to P1394a, single cable(including 6-pin and 4-pin) must be capable to all speed defined by the standard. This principle is very important aspect of 1394 serial bus. However, POF and UTP specifications do not meet this principle.	229	T	MS	Removal of POF rejected Sockets are different for POF and glass. Removal of HPCF accepted Agree with intermateability problems.
126	3	John N Fuller	IEEE Std 1394a-2000	230	E	All	Accepted Throughout the document, specific references to IEEE Std 1394a-2000 are to be used. When the generic standard is meant, use IEEE 1394.
126	7	David R Wooten	This use is inconsistent with other places in the spec. Should use the beta character everywhere or use 'b' suffix.	231	E	All	Accepted "Beta" is to be used uniformly.

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
126	36	David R Wooten	This table has bold lines separating the headings from the other rows. This is not bad but it is not like the other tables in the spec.	232	E	MS	Accepted
126	3	Steven R Bard	reference to P13194.a is incorrect. replace it with IEEE Std 1394a-2000"	233	E	MS	Accepted
129	32	Colin Whitby-Strevens	Signal detect spec is missing	234	T	MB VT	Deferred Need accurate technical assessment of clause 8. "Owners" to recruit assistance.
129	11	David R Wooten	The parameters for transmit and receive should be done in eye diagram like all the other media types.	235	T		
131	47	Clay E Hudgins	p. 131. Figure 9-1 is not referenced in the text. Also, it is unclear what relationship the sketch has to the figure title. The figure's title is "CAT-5 unshielded twisted pair PMD" The drawing is a sketch of a node interface architecture. This is not a figure of a "CAT-5 unshielded twisted pair PMD."	236	E	MS	Accepted
131	52	David R Wooten	"sublayer for" rather than "sublayer of".	237	E	MS	Accepted
132	4	David R Wooten	over as much as. We don't specify anything longer than 100M.	238	E	MS	Accepted
132	4	Steven R Bard	This seems to imply a starting distance of 100 meters and up. Isn't it really 100 Meters maximum distance and shorter lengths are good?"	239	E	MS	Accepted
134	1	Colin Whitby-Strevens	This paragraph needs to be updated to reflect the fact that auto-crossover is required for UTP. The second sentence provides the "default" mode of operation. The last sentence is definitely wrong. I suggest something like:-A crossover, when provided, shall connect pins 1 and 2 of the media interface connection segment to pins 7 and 8 respectively at the other end of the connection segment, and vice versa. When no crossover is provided, pins 1, 2, 7 and 8 of the media interface connection segment shall be connected to pins 1, 2, 7 and 8 respectively at the other end of the connection segment.	240	T	MS	Accepted In addition, specify that a PHY that supports this PMD shall support auto-crossover detection.
135	34	David R Wooten	Since these notes are not referenced in the table, they should not be numbered.	242	E	MS	Accepted
140		Steven R Bard	Each "blank" draft page should have the words "This page left blank intentionally" - or something equivalent.	243			
140		David R. Wooten	This is a duplicate page 140	244	E	EH	Accepted
141		Colin Whitby-Strevens	p139 and 140 have already been used	245	E	EH	Accepted

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141	10	MDJTeener	need text or a subclause on the specific interfaces for the beta port (corresponding to the C-code stuff), otherwise it's just too hard to understand just what the Bport does …."	246	E	CWS	Accepted
141		David R. Wooten	This is a duplicate page 139	247	E	EH	Accepted
145	6	Chris S Dorsey	Table 10-1 uses "rd" prior to the definition of "rd". Suggested Remedy = Add a NOTE following Table 10-1 to direct the reader to the definition of "rd".	248	E	CWS	Accepted. Text added rather than a note.
146	22	Colin Whitby-Strevens	BORDER	249	E	CWS	Accepted
146	41	John N Fuller	These notes should be numbered because the above table references them by number.	250	E	CWS	Accepted
148	25	David R Wooten	I think this is very confusing. The diagram illustrates that the data to be scrambled is loaded in parallel but the scrambler bits seem to be loaded serially. This would imply that the scrambler only advances on bit for each scrambled byte and I don't think that is true.	251	E	CWS	Accepted
148	18	David R Wooten	Is this a limiter i.e. is it trying to say that the only valid control symbols to precede a data byte are either a packet prefix or a pad symbol? If so, it should be clearer.	252	E	CWS	Accepted
149	21	David R Wooten	Why do we have two paragraphs describing how to scramble a request symbol when the method of scrambling is the same in both cases?	253	E	CWS	Accepted
151	52	David R Wooten	The description of the scrambling is much more confusing that it needs to be. I believe that the schematic for the scrambler can be converted into a single schematic with the inputs on the left being selected as either being a data byte, control symbol or arbitration token and the outputs modified as appropriate (two zeros forced for arbitration). Would also like to make it clear that after each 'thing' is scrambled, the scrambler is advanced 8 bits before the next thing is scrambled. There should be something added to show how the next k:k+7 bits of the scrambler output register can be generated in a single cycle. Also, it might be clearer overall if we simply use the x bits of the scrambler polynomial generator as the scrambler output register. Proposed drawings available upon request.	254	E	CWS	Partially accepted New drawing meets the second objective.
152	55	Farrell Ostler	and. Suggested Remedy = remove the period	255	E	CWS	Accepted

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
159	51	John N Fuller	Why is this output listed in reverse order? In the coding table above D28.0 is listed as 00111 000.	257	E	CWS	Accepted
160	18	David R Wooten	Notes should not be numbered unless they are referred to by number.	258	E	CWS	Accepted
163	25	David R Wooten	Legacy and Beta format for packets has not yet been defined. It should be defined before being used here.	260	E	CWS	Accepted
163	33	David R Wooten	This should not be a note. This may be the only place that it is specified that a speed code will not be sent if node is received.	261	E	CWS	Accepted
164	28	John N Fuller	loss	262	E	CWS	Accepted
164	1	David R Wooten	Notes should not be numbered.	263	E	CWS	Accepted
164	17	David R Wooten	How does a training signal cause the other node to begin training? Also, isn't it a training “sequence” rather than a training “signal”?"	264	T	CWS	Accepted
164	28	David R Wooten	loss	265	E	CWS	Accepted
164	51	David R Wooten	SYNC_CHECK is only defined by a #define in the C-code. It must be defined in a more obvious place.	266	E	CWS	Accepted
164	44	David R Wooten	It is not clear how the scrambler can become set correctly.	267	E	CWS	Accepted
164	28	Kiyoshi Miura	typo; “los” should be “loss”	268	E	CWS	Accepted
165	10	David R Wooten	It's just an “OPERATION configuration request” not an “OPERATION configuration request signal”.	269	E	CWS	Accepted
167	34	David R Wooten	Shouldn't this include receiving anything other than Sc in the pad position of a padded character?	271	T	CWS	
173	3	MDJTeener	Same general comment here. Need an interfaces section (perhaps services) to really show how connection management communicates with the other stuff …	272	T	?	Tentatively accepted. Owner needed to do the work.
174	16	Steven R Bard	page 174, line 16 “bought” should be “brought”	273	E	CWS	Accepted
175	7	Kiyoshi Miura	Description of restore variable seems missing.	274	E	CWS	Accepted
176	6	Colin Whitby-Strevens	possibly annotate (DS Ports only)	275	E	CWS	Accepted
176	8	Colin Whitby-Strevens	possibly annotate here as well, except that ports operating in Beta mode are permitted to use this constant rather than a more elaborate formula"	276	E	CWS	Accepted
176	21	Colin Whitby-Strevens	this is wrong, and the range is wide, so delete this.	277	T	CWS	Accepted
176	42	Colin Whitby-Strevens	2.0002	278	T	CWS	Accepted
177	9	Colin Whitby-Strevens	Beta_mode_only should be “Beta_mode_only_port”	279	E	CWS	Accepted
177	7	David R Wooten	There seems to be a mix of font sizes here	280	E	CWS	Accepted
177	19	David R Wooten	Of which standard?	281	E	CWS	

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178	3	Colin Whitby-Strevens	)	282	E	CWS	Accepted
178	15	Colin Whitby-Strevens	FALSE missing after “connection_unreliable =“ on P0:P1 actions"	283	E	CWS	Accepted
178	15	John N Fuller	right hand side of assignment missing.	284	E	CWS	Accepted
178	3	Farrell Ostler	Missing right parenthesis for condition on the P11:P2 transition. Suggested Remedy ="	285	E	CWS	Accepted
179	12	David R Wooten	Shouldn't a Beta capable port be toning while in the disconnected state?	286	T	CWS	Accepted
179	3	David R Wooten	Might want to remove this note and simply let this be something that is discovered.	287	E	CWS	Accepted
179	5	David R Wooten	Shouldn't port states be upper case (i.e. “Disconnected”)?"	288	E	CWS	Accepted
180	6	David R Wooten	Capitalization	290	E	CWS	Accepted
181	50	John N Fuller	Insert “one”	291	E	CWS	Accepted
181	47	David R Wooten	Change second sentence to “The active bus of which the Standby nephew node is a member is not informed of any status change of the Standby nephew node (…	292	E	CWS	Accepted Also, “standby nephew” is redundant; change to “nephew” throughout.
181	18	David R Wooten	Capitalization	293	E	CWS	Accepted
181	5	Kiyoshi Miura	Font of this “restore” should be the same as “standby_fault” in this sentence.	295	E	CWS	Accepted
181	30	Kiyoshi Miura	Descriptions of transition P12:P11 and P12:P0 seem missing. It might be OK since transition conditions are described in State P12 description.	296	E	CWS	Accepted
182	8	Colin Whitby-Strevens	After restore, does the link/transaction layer need to wait for cycle start before issuing a new isochronous request? The problem is that the restored node has no concept of isochronous phase (odd/even) until the first cycle start.	297	T	CWS	Accepted Link shall wait until the cycle phase is known.
182	8	Colin Whitby-Strevens	Does register0 transfer accompany PHY_RESTORE_ status? Need to be sure that the PHY does not repeat a packet to the link until the link has seen the PHY_RESTORE_RST event (which the link uses to clear invalid).	298	T	CWS	Accepted The register zero data *follows* the PH_RESTORE.status indication. The PHY shall not send a packet until register zero is transferred.
182		David R Wooten	Field names need some different font or capitalization to make them stand out.	299			
182		David R Wooten	Should be “ATTACH_IN_PROGRESS” instead of “generation_number”.	300			

Type: E: Editorial K: Kvetch T: Technical

P1394b Ballot Response Actions Table (BRAT)
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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
183		John N Fuller	Inconsistent use of fonts for “HR” “HR” is undefined at this point, please define.	301			
183		David R Wooten	This is not clear. Is the LTS a single symbol that follows a pair of DATA_PREFIX symbols or a continuous stream of symbols that follows a DATA_PREFIX. If a continuous stream, then there is a problem of having a single error prevent proper decoding of all LTSs since the disparity will always be wrong once it is wrong once (nothing to reset the disparity to a known value every so often).	302			
183		David R Wooten	Format of the LTS is only shown in the C-code. Would be nice to have a schematic in the text.	303			
184		John N Fuller	What is meant by this sentence? Does just deleting “they” convey the proper meaning?"	304			
184	6	Clay E Hudgins	Consider replacing “should” with “shall”.	305			
184		David R Wooten	Need to specify some update rate for the generator. Might want to relax the requirement that the generator run continuously so that power can be reduced when all ports are in standby or suspend	306			
185		David R Wooten	This is not correct. It should say that when a port is connected to a Legacy node, there is no exchange of LTPs.	307			
185		David R Wooten	This wording is awkward. The last sentence segment should be moved ahead of the LTS phrase.	308			
185		David R Wooten	It is not clear that the 'limited support' is only allowed on a PHY with a single, Beta-mode capable port, or on a two-port border node where one port is DS only and the other is operating in Beta mode.	309			
186	1	John N Fuller	I'm not at all certain that this whole section is informative, certainly some parts are. I believe that if a section is truly informative that it may be deleted leaving a standard that is fully specified, I do not think that this is true here. For example I don't see the information about startup negotiation in a normative section.	310	T	CWS	Accepted Recommend that the normative and informative material be separated and that the informative be removed to an annex.
186	24	David R Wooten	Legacy node?	311	E	CWS	Accepted
187	6	David R Wooten	phase shifts in TpBias?	312	E	CWS	Accepted
187	8	David R Wooten	this is unavoidable	313	E	CWS	Accepted
187	52	David R Wooten	font for con_status?	314	E	CWS	Accepted
188	3	David R Wooten	:”;but” (need to promote the , to a ;)"	315	E	CWS	Accepted
188	6	David R Wooten	1394-1995	316	E	CWS	Accepted

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
188	12	David R Wooten	connect_status	317	E	CWS	Accepted
188	22	David R Wooten	I don't understand these last two optical transceiver entries. Neither of them ends up with us in Beta mode which sounds like a problem	318	E	CWS	Accepted
188	26	David R Wooten	This sentence makes no sense. It should be removed	319	E	CWS	Accepted
189	1	David R Wooten	I know this is an “English language” standard but I think it should be “while”	320	E	CWS	Accepted
189	23	David R Wooten	This “table” does not agree with the C-code. The C-code supports an additional 3 'data' bits. The table should be expanded to indicate that the other codes are reserved for future standardization.	321	T	CWS	Accepted
190	1	David R Wooten	Capitalize “Figure”	322	E	CWS	Accepted
190	45	David R Wooten	font?	333	E	CWS	Accepted
190	51	David R Wooten	… hardware comparator being active.	334	E	CWS	Accepted
190	34	David R Wooten	State names are not properly capitalized.	335	E	CWS	Accepted
191	32	Burke Henehan	Change “all” to “allows the” Suggested Remedy ="	337	E	DRW	Accepted
192		Colin Whitby-Strevens	this heading not hyperlinked nor in the table of contents	338	E	DRW	Accepted
192		Colin Whitby-Strevens	see comment in Table 12-1	339	E	DRW	Accepted
192		John N Fuller	for some reason this section is not in the TOC, perhaps the paragraph style is wrong.	340	E	DRW	Accepted
193		Colin Whitby-Strevens	inconsistent capitalization of the word link (or Link) in this table. Inconsistent capitalization - data bus (1st entry) and Control bus (4th entry)	341	E	DRW	Accepted
193		Colin Whitby-Strevens	use same wording as for Ctrl (line 13)	342	E	DRW	Accepted
193		Colin Whitby-Strevens	Clause 12.2 defines a pin on the PHY called “Beta_Mode” to indicate the mode of the PHY/Link interface bus. However, “Beta_Mode” causes a VHDL name clash with the C Code variable tracking the mode of each port. I propose naming the pin “Beta_Mode_link”	343	E	DRW	Accepted
194		Colin Whitby-Strevens	Beta_Mode_Link (if above comment accepted).	344	E	DRW	Accepted
194	13	Burke Henehan	I believe to clarify what is being referenced the word “Legacy” should be replaced by IEEE Std 1394a-2000. The PHY-Link interface defined in 1394-1995 was not precise in its definitions leading to incompatible, but compliant implementations. Suggested Remedy = The word “Legacy” should be replaced by IEEE Std 1394a-2000.	345	E	DRW	Accepted

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
199		Colin Whitby-Strevens	Cancellation of "Late" link requests Setup: At link in the even phase, link issues a next_odd (Req #1) and sometime later issues a current (Req #2). Subsequently, the link receives from the PHY an ARB_RST_ODD followed by a GRANT. Assuming Req #1 and Req #2 have the same speed and format, the link can not determine whether the GRANT was for Req #1 or Req #2. Scenario A: PHY issued ARB_RST_ODD and GRANT after receiving Req #1 but before Req #2. Consequently, when Req #2 arrives, it is queued by the PHY. Scenario B: PHY issued ARB_RST_ODD before receiving Req #1. Req #1 and Req #2 both received by PHY before it issues a GRANT. In this case, Req #2 has updated and replaced Req #1. After issuing the GRANT, no requests are pending in the PHY. From the link's perspective, scenario A and scenario B look identical in terms of order of arriving indications from the PHY. But in scenario A, a request in still pending in the PHY and the link should not reissue, and in Scenario B no requests are pending and the link does need to re-issue. Proposed fix is that after sending a GRANT to the link, the PHY discards all LREQs for the same "pipe" (asynchronous or isochronous) as the GRANT until the link acknowledges the GRANT by taking possession of the PHY/Link interface. If so, then Scenario A would end up with no request pending in the PHY since it ignored Req #2 from the link.	346	T	DRW	Accepted in principle. A race condition was eliminated by a new link request cancellation rules. After the PHY grants a particular type of link request, e.g., asynchronous or isochronous, all other requests of the same type received by the PHY before the end of the packet are cancelled.
202		Colin Whitby-Strevens	(see also next page)	347			
203		Colin Whitby-Strevens	In the case that RA is present, (RFMT is not used), is there a cycle for RFMT or not? Clarify.	348			
206		Colin Whitby-Strevens	DATA_PREFIX should not be in this table. It has the value 1111 1111, and you have not committed to Legacy or Beta Format at that stage.	349	E	DRW	Accepted Combine both tables to make usage clear. Change all reserved values to mean DATA_ON (define term).
206		Colin Whitby-Strevens	or Legacy PHY packet spacing, which ever is smaller.	350	E	DRW	Accepted
207		Colin Whitby-Strevens	Heading not hyperlinked nor in the table of Contents	351	E	DRW	Accepted
207		John N Fuller	Again, paragraph not in TOC	352	E	DRW	Accepted

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P1394b Ballot Response Actions Table (BRAT)
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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
209		Colin Whitby-Strevens	Need clarification on whether there is a concept of MAX_HOLD time on the B Parallel PHY/Link interface. If so, is it twice the number of cycles as that for 1394a (1394a MAX_HOLD = 47 SCLKs, which is the max time the link can continuously assert hold on ctl[0:1] after observing grant)?"	353	T	DRW	Accepted. MAX_HOLD is 64 LClks. Other parameters that constrain the PHY remain to be specified.
211		Colin Whitby-Strevens	Delete the parenthetical statement; it is necessary in some circumstances (not just a question of efficiency)	354	E	DRW	Accepted
211		Colin Whitby-Strevens	Even Asynchronous Request should be "Next Even Asynchronous Request" Likewise Odd Asynchronous Request should be "Next Odd Asynchronous Request" Perhaps this table should use precisely the same names as Table 12-5"	355	E	DRW	Accepted
214		John N Fuller	not in TOC	356	E	DRW	Accepted
219		Colin Whitby-Strevens	PHY-Link interface, not the PHY"	357	E	DRW	Accepted Clarify that it applies only to PHYs designed to accommodate dynamic changes to the PHY/link interface.
219	4	Burke Henehan	Due to much better consistency in defining the PHY-Link interface, the word legacy should be replaced with the words "IEEE Std 1394a-2000" in this sentence.	358	E	DRW	Accepted
221		Colin Whitby-Strevens	PClk duty cycle has to be tighter than LClk duty cycle, in order to allow links to derive LClk from PClk without the use of complex circuitry. I suggest 45/55 for PClk"	359	T	DRW	Accepted. PClk set at 45/55 and LClk at 35/65.
228	34 - 37	Steven R Bard	It is not precisely clear how the PIL places the PIL/FOP interface into standby. Is it the PIL port that goes into standby? Or is it the FOP port connected to the PIL? Is there an Uncle operation for the port? Is the PIL/FOP "interface" allowed to go into standby when there are other active ports on the FOP? Is the PIL/FOP interface going into standby similar in function to the state of the parallel PHY/Link interface when LPS is not asserted?"	361		DRW	

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
228		Steven R Bard	page 228 line 38 and 39… It is not clear to me as to how I would go about “disabling” the PIL port. The PIL/FOP functions as a single node BUT, there is a PHY port in the PIL and a PHY port in the FOP - these two ports are connected together. It is not allowed to “disable” the far port, so the host is not able to disable the FOP port connected to the PIL and I'm not sure how I would address the PIL port so as to disable it since the “PHY” registers the host would be accessing would be the ones in the FOP. I think some additional technical work is needed on this and I shall be happy to work with the BRC in completing this work.	362		DRW	
231		Steven R Bard	page 231 line 6 I'm not so sure LinkOn should not be used when the PIL-FOP connection is in standby. If the PIL-FOP in standby is synonymous with the parallel PHY-Link interface state when LPS is not asserted, then LinkOn should be active when PIL-FOP connection is in standby. Just because the PIL-FOP connection is in standby does not mean there is inactivity on the other ports in the FOP. The host may have configured the FOP port registers to generate PORT_EVENT and PORT_EVENT should cause LinkOn if the PIL-FOP connection is in standby.	363		DRW	
231		Steven R Bard	page 231, Clause 13.6 lines 11-13 So, it would seem then that placing the PIL-FOP connection into standby causes the PIL port on the FOP to enter the disconnected state. I think further discussion needs to take place regarding the logical/physical behavior the PIL/FOP connection and the synonymous state/behavior of the parallel PHY/Link interface. I'm thinking there is no “standby” of the PIL/FOP connection - just disconnected or connected. This means, no toning on the PIL/FOP connection???"	364		DRW	
236	44	Colin Whitby-Strevens	delete this row	366	E	CWS	Accepted
236	42	Colin Whitby-Strevens	Beta_mode_only should be “Beta_mode_only_port”	367	E	CWS	Accepted
238	5	Colin Whitby-Strevens	ru	368	T	CWS	Accepted
242		MDJTeener	Should be part of a common PHY/Link interface clause	369		MJT	
242		David R Wooten	Remove P1394b and replace with “A PHY compliant with this standard”	370		MJT	

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
245		David R Wooten	Isn't this table contradictory to other tables with respect to minimum supported speeds? I think we allow a Beta-only node to refuse to work at speeds below S400.	371	E	MJT	Accepted. Clarify text to make it plain that packet transmission at rates below S400 is not required.
246		Colin Whitby-Strevens	bad cross-reference	372		MJT	
246		Colin Whitby-Strevens	also need PH_DATA_HOLD	373		MJT	
247		Colin Whitby-Strevens	Something missing???	374		MJT	
247		Colin Whitby-Strevens	The packet formats as specified in 15.4.3 et seq are inconsistent with the C code, and probably overly restrictive. It is not clear how to resolve this inconsistency.	375	T	MJT	Accepted. Section revamped to resolve inconsistencies.
247		Colin Whitby-Strevens	Not consistent with C code usage, and do not allow the start of a packet to be described consistently.	376	E	MJT	Accepted. See BRAT ID 375 for details of resolution.
247		Colin Whitby-Strevens	PH_DATA_START	377	E	MJT	Accepted
248		Colin Whitby-Strevens	is	378	E	MJT	Accepted
248		Colin Whitby-Strevens	with a Legacy link.	379	E	MJT	Accepted
248		Colin Whitby-Strevens	packet end symbol	380	E	MJT	Accepted
248		Colin Whitby-Strevens	should, not shall. There's no reason to be more restrictive than 1394a. Also inconsistent with the table. Suggest duplicating the words from 1394a (p92 in 1394a) D5.0"	381	T	MJT	
248		Colin Whitby-Strevens	should, not shall. There's no reason to be more restrictive than 1394a. Also inconsistent with the table. Suggest duplicating the words from 1394a (p92 in 1394a) D5.0"	382	T	MJT	
249		Colin Whitby-Strevens	symbol	383	E	MJT	Accepted
249		David R Wooten	The use of 'speed signal' is confusing. The indication of speed in B is through a sequence of speed codes rather than through and analog speed signal as in 1995 and 1394a. Perhaps calling this 'speed symbols' or 'speed code' would be more descriptive?	384	E	MJT	Accepted
249		David R Wooten	Why are there more than two packet end symbols?	385	T	MJT	Accepted. Should be $PE^{\{24\}}$.
249		David R Wooten	At S800, each symbol is about 10 ns. 23 symbols would fill 230 ns. Is this what is intended here?"	386	T	MJT	Accepted. The actual number of symbols depends upon the resolution of BRAT IDs 391 and 382.
249		David R Wooten	Need to get rid of the line break.	387	E	MJT	Accepted

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P1394b Ballot Response Actions Table (BRAT)
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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
249		David R Wooten	Think sequence should be 20, 24, 28. For an S200 connection, will need at least 5 symbols to insure 180 ns between an Sa symbol and the first data symbol. 5 symbols at S200 is same as 20 symbols at S800 so…"	388	T	MJT	Accepted. See BRAT ID 375 for details of resolution.
249		David R Wooten	8, 12, 16, 20 …"	389	T	MJT	
250		Colin Whitby-Strevens	Needs resolving	390		MJT	
250		Colin Whitby-Strevens	value not defined anywhere	391		MJT	
250		Colin Whitby-Strevens	value not defined anywhere	392		MJT	
250		Colin Whitby-Strevens	Odd name for the heading. 1394a calls this “Cable PHY packets”	393		MJT	
250		Colin Whitby-Strevens	Description of self-ID packet is missing - should be included as the sp field has changed (now always 11).	394		MJT	
250		Colin Whitby-Strevens	What should the value of the sp field be in a self_ID packet if a node is operating in Legacy mode (i.e. no beta ports or link) - just like 1394a? or is 11 allowed?	395		MJT	
250		David R Wooten	Don't number notes when they don't have a reference.	396	E	MJT	
250		David R Wooten	Have to resolve this editorial comment.	398	E	MJT	
253		David R Wooten	font too small	400	E	MJT	
254		Colin Whitby-Strevens	delete from here as it is also in Table 11-3	401		MJT	
254		John N Fuller	The value of CONFIG_TIMEOUT needs to be adjusted to account for the false detect scenario described at the 1394 TA's Architecture Working Group meeting in Brussels April 2000. Should be ~246.6 to 246.9 us.	402	T	MJT	Accepted. Ask John how he derived the values.
255	14	Junichi Takeuchi	MAX_BETA_TIME (min) 114.2 us . This constant seems to be a big value. Suggested Remedy = MAX_BETA_TIME (min) 114.2 us. This constant should be one of the values below. (1) 167<MAX_ARB_STATE_TIME> -(40.3<max async packet>+(5 * 3.5<radial delay>)) = 109.2(us) (2) 167-(80.6<max isoch packet>+(3 * 3.5)) = 75.9(us) 1. Senior Border sends BORDER token and reaches BOSS(on the far side) 2. BOSS starts sending max isochronous packet just before it receives the BORDER token, and after that GRANT goes to the Senior Border 3. A null packet is transferred"	403	T	MJT	Tentatively rejected. Jerry Hauck to provide explanation so someone else can write the response text.
258		David R Wooten	This should be the same as a Legacy formatted packet.	404	E	MJT	Accepted. See BRAT ID 375 for details of resolution.
258		David R Wooten	two control characters for each of packet prefix and packet end	405	E	MJT	

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
258		David R Wooten	It may be a requirement that at least one of these four symbols be deletable.	406	T	MJT	Accepted. See BRAT ID 375 for details of resolution.
264		Kiyoshi Miura	Typo; shot -> short	408	E	MJT	
264		Kiyoshi Miura	If a 100m optical (or UTP) cable is used, cable delay might be 500 ns. (I'm not sure this value since no cable delay specifications found in this draft. I think cable delay specifications are necessary.) If cable delay is 500 ns, it might take more than 1.4 us for the peer node's short bus reset to reach the port. 1.4 us is 500 ns x 2 and PHY delay. It is close to max of SHORT_RESET_TIME so that the port goes to the Tree-ID start state before the peer node finishes bus reset since IDLE received which was sent from the peer node before bus reset. My suggestion is that reset_received() is added to reset_wait_actions. The reset_receive function checks if bus reset signal has been received on the active ports after entering Reset Start state.	409		MJT	
265		Colin Whitby-Strevens	T2:T3 is “portRarb[parent_port] == ROOT_CONTENTION” For the root node, parent_port = NPORT; however, portRarb is indexed as 0 to NPORT-1. Evaluating T2:T3 at the root causes a range error. T2:S0 avoids the problem by testing “root” first which, via Boolean short circuiting, bypassed the portRarb test. Suggest the condition be changed to !root && portRarb[parent_port] == ROOT_CONTENTION"	410	T	CWS MJT	Accept
267		Colin Whitby-Strevens	Actions on the S4:A0b transition are: if (!Beta_mode[parent_port]) port_speed[parent_port] = portRspeed[parent_port]; portRspeed (and maybe port_speed) is defined with a range of 0 to NPORT-1. At the root node, parent_port = NPORT. Consequently, the above actions causes a range error when evaluated. A suggested fix would be to have the if condition be: if(!root && !Beta_mode[parent_port]) …	411	T	CWS	Accept
270		Colin Whitby-Strevens	close this gap	412	E	CWS MJT	Accept
273		David R. Wooten	page numbers 271 and 272 are missing.	413	E		
274		Colin Whitby-Strevens	No Z typedef enum {L, H} tpSig; // Differential signal on twisted pair"	414	E		

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
274		Colin Whitby-Strevens	These values will have to be re-assigned, to deal with the overloading which is used for DS arbitration line states. Also one or two new ones will have to be introduced to deal with the fact that in DS mode, different encodings are used for RX and TX versions of the same arbitration states"	417			
274		James M. Skidmore	(Comment #11) Table 16-2, pg. 274 line 17 Add RESET_WAIT to enumerated list of wait_times.	418			
276		Colin Whitby-Strevens	A proper service interface should be used for PMD, rather than the use of variable shared between several modules and the PMD. It needs to be made clear which port machine is controlling the PMD at any given time (i.e. the control signal for a PMD mux). Various C code modifications proposed for “to PMD” direction, similar changes also required for the “from PMD” direction.	419			
276		Colin Whitby-Strevens	revised to // PMD services - these all apply on a per-port basis, the port is implicit // as these are referenced from the per-port code (except for bias_detect) typedef enum { PMD_CROSSOVER = 1, PMD_NO_CROSSOVER = 2, PMD_TONE_ON = 3, // instructs the PMD to generate a tone (see 6.8.1) PMD_TONE_OFF = 4 // instructs the PMD to cease generating a tone, // remove the signaling bias voltage and set the // port transmitters to high impedance PMD_SELECT_BPORT = 5, // PMD uses bport for beta mode I/O - only set while // bport_active is TRUE, unset during suspend etc PMD_SELECT_DS_PORT = 6, // PMD uses dsport for data, arb states and speed signals // remains set during suspend etc // note, this does not affect use of bias or dc connect PMD_UNSELECT_PORT = 7, } PMD_control_request_type; PMD_CONTROL_request(PMD_control_request_type control_request, speedCode speed); // Beta PMD Boolean local_plug_present; // When AC coupled (possibly via, say, an optical transceiver), // indicates that an external implementation dependent mechanism has determined that // there is at least a physical connection from the local node to a cable // (although there may not be a connection to the peer port). Used to avoid // performing connection toning if there is definitely no connection. If there // is no such mechanism, then this flag shall be set permanently to TRUE. // This is a read-only bit in the port register	420			

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			map. typedef struct { dataBit data; } PMD_data_ind_service; // for data from PMD void PMD_DATA_request(dataBit data); Boolean signal_detect; // set by PMD if a valid signal is being received. PMD_data_ind_service waitPMD_DATA_indication(); // DS PMD Boolean bias_detect[NPORT]; // Undebounced output of the PMD bias comparator, shared with PMD Boolean connect_detect; // undebounced PMD output of connect_detect comparator RX_signal ds_portR; // Return current signal from port void ds_portT(portData pd); // Transmit the data/strobe encoded data on the DS port void ds_portTarb(TX_arbstate arb); // Transmit the specified arbitration state on the DS port.void ds_portTspeed(speedCode speed);// Transmit the specified analog speed signal on the DS port void tpBias(tpBiasSig sig); // sig = Bias_On instructs the PMD to generate TpBias on TPA // (as defined in IEEE 1394-1995). // sig = GND instructs the PMD to drive the common mode voltage on TPA to VG. // sig = ZZ instructs the PMD to cease generating TpBias and // set TPA to high impedance. Boolean rx_S200, rx_S400; // Outputs from speed signal comparators"				
276		James M. Skidmore	(Comment #1) Table 16-3, pg. 276 (phy_services.h) The ds_portR, rx_S200, and rxS400 variables should be arrays. Change line 40-41 from: RX_signal ds_portR; Boolean rx_S200, rx_S400; to: RX_signal ds_portR[NPORT]; Boolean rx_S200[NPORT], rx_S400[NPORT];"	421			
277		Colin Whitby-Strevens	Deal more sanely with the issue of reset_notify clearing on successful transfer to the link, so insert void PH_EVENT_response(Boolean event_OK);"	422			
278		James M. Skidmore	(Comment #2) Table 16-5, pg. 278 (shared.h) The sync_error_signal and sync_lost_signal variables are per-port-variables, and should be declared as arrays, or moved to the port.c module (sec 16.2.2, pg. 290).	423			
279		Clay E Hudgins	p. 279, line 19-20. Consider replacing “should” with “shall”.	424			
279		James M. Skidmore	(Comment #3) Table 16-5, pg. 279 (shared.h) The bport_active variable is a per-port-variable, and should be declared as an array, or moved to the port.c module (sec 16.2.2, pg. 290).	425			
280		Colin Whitby-Strevens	push down several lines (alphabetic ordering)	426			

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
282		Colin Whitby-Strevens	// shared between bport_tx.c, port.c and process_req.c"	427			
284		James M. Skidmore	(Comment #4) Table 16-6, pg. 284, function restore_port.For-statement incorrect. Change pg. 284 line 23 from: for (j = 0; j++; j < NPORT) to: for (j = 0; j < NPORT; j++)"	428			
286		James M. Skidmore	(Comment #12) Table 16-6, pg. 286-287, function con_mgmnt_granted The in_test_interval variable not needed. The test_interval_timer variable should only be reset upon sending a new LTP packet. If a short-bus-reset is to initiated, there should be no packet-end sequence. Change pg. 286 lines 28-55, pg. 287 lines 2-3 from: } else { // request for loop test … } to: } else { // request for loop test if ((link == Legacy_Link) && (breq == FAIR_REQ || breq == PRIORITY_REQ)) { breq = NO_REQ; // Cancel the request PH_ARB_confirmation(PH_LOST,0, 0); // And let the link know } PH_DATA_indication(PH_DATA_PREFIX,0, 0); // Send notification of bus activity for (i = 0; i < NPORT; i = i + 1) portTarb(I, DATA_PREFIX); // Ensure the bus is held with DATA_PREFIX. max_occupancy_timer = 0; // Start the occupancy timer. release_bus = FALSE; in_control = TRUE; while (!release_bus) if (need_new_LTP) { send_LTP; test_interval_timer = 0; need_new_LTP = FALSE; } received_attach = FALSE; // Clear flag if set start_tx_packet(S100, LEGACY); // Send null packet to clean up, in_control = FALSE; // then release the bus. if (!isbr_OK) // The isbr_OK flag is set in untested_actions. stop_tx_packet(DATA_END, S100, DATA_END_TIME, LEGACY, NPORT); }"	429			
287		James M. Skidmore	(Comment #13) Table 16-6, pg. 287, function test_port_selector There's no mechanism to keep an aborted port from being re-selected. There's a code race condition which could result in the while loop getting stuck. When a port completes the loop-test, its port_under_test flag is cleared by loop_test_interval_actions. At the same time, the release_bus flag is set, which causes con_mgmnt_granted to terminate and the arb-state-machine to transition to the R0 reset-start state. But this, in turn, causes the con_mgmnt_request flag to be cleared. Now suppose that this code (test_port_selector) executed before the arb-state-machine transitioned to the R0 state. A new test_port would be selected	430			

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			and con_mgmnt_request would again be set. But con_mgmnt_request would be cleared upon entry into R0 (see initialize_arbitration), and there's no mechanism for it to be set again. The following while loop would be stuck. It's waiting for.port_under_test to be cleared by loop_test_interval_actions, which is waiting for in_control to be set, which is set upon entry into con_mgmnt_granted, but which won't be entered because the con_mgmnt_request flag was cleared by reset_start_actions (see initialize_arbitration). Also, considers what happens if a node has more than one untested port, and while the selected test-port is waiting for the test-interval to elapse, one of the other untested ports receives an attach-request symbol? This will cause the bus to be released and a short-bus-reset to be started, but the port_under_test flag won't be cleared, so the test_port_selector routine will be stuck in the while loop. To fix this, add code to exit the while loop if a bus-reset is started. Change lines pg. 287 15-25 from: for (i = 0; i < NPORT; i++) { // selects ports in turn - important if testing a particular port // is aborted … } to: for (i = 0; i < NPORT && !bus_initialize_active; i = i + 1) { // Selects ports in turn - important if testing a particular port is aborted. // Select unique port to test if none already selected (do not need to search from port 0), // but don't select a port that is currently receiving a dominant LTS value. if (untested[i] && !((test_interval_timer >= TEST_INTERVAL) && !need_new_LTP && ((portRarb[i] == DATA_BYTE) && ((current_data[i] & 'h3F) > HR_test_value) || ((current_data[i] & 'h80)) != 0))) { received_LTS = 0; // once in 64, this will cause a phantom potential collision port_under_test[i] = TRUE; test_port = i; con_mgmnt_request = TRUE; // and request the bus while (port_under_test[i] && !bus_initialize_active) ; // and sit here while the port is tested test_port = NPORT; port_under_test[i] = FALSE; con_mgmnt_request = FALSE; // don't need to request the bus now } }"				
287		James M. Skidmore	(Comment #14) Table 16-6, pg. 287, function loop_test_interval_actions Loop-healing logic needs to wait for the test_interval_timer to increment to at least TEST_INTERVAL time	431			

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			before comparing LTS values. If an attach-request is received on any port, then processing in this function should be skipped (the processing in untested_actions should control the release of the bus, etc.). I can't see any need for the in_test_interval flag--all references to this flag may be deleted. I suggest the following to replace the loop_test_interval_actions function in its entirety. void loop_test_interval_actions() { // continuously running static int collision_count; if (power_reset) { collision_count = 0; in_control = FALSE; HR_test_value = new_test_value(); while (power_reset) ; return; } if ((test_port != NPORT) && port_under_test[test_port]) { // Delay testing until the test port selector has initialized a new port to test. if (received_attach) // Attach-request symbol rcv'd on some untested port (not necessarily the test_port). ; // Do nothing. // Check if the test-port is receiving a dominant LTS from its peer port. else if ((test_interval_timer >= TEST_INTERVAL && !need_new_LTP && (received_LTS & 'h3F) > HR_test_value) || (received_LTS & 'h80) != 0) { // We've waited long enough for the last xmitted LTP to reach all // nodes in the network, and the received LTS is dominant, so abort // testing on this port (go to next). port_under_test[test_port] = FALSE; release_bus = TRUE; while (in_control) ; return; } // Check if there's a collision between the xmitted LTS and the rcv'd LTS. else if (in_control && test_interval_timer >= TEST_INTERVAL && !need_new_LTP && (received_LTS & 'h7F) == ((HR_G << 6) | HR_test_value)) { // There's a collision between xmitted LTS and received LTS. if ((USING_EUI) && (collision_count == 0)) EUI_sequence = 0; // reset the EUI sequence collision_count = collision_count + 1; if (collision_count == COLLISION_LIMIT) { loop_disabled[test_port] = TRUE; // place port in loop disabled state port_under_test[test_port] = FALSE; release_bus = TRUE; while (in_control) ; collision_count = 0; return; } HR_test_value = new_test_value(0); HR_G = (HR_G == 0) ? 1 : 0; need_new_LTP = TRUE; return; } // Check if the test-port can be attached. else if (in_control && test_interval_timer >= TEST_INTERVAL && !need_new_LTP) { // Test interval has expired, and we're in control, without a collision collision_count =						

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			0; // Clear any bogus collisions HR_mode = ATTACH_IN_PROGRESS; // Should not receive attach-request on any port // once this is set. need_new_LTP = TRUE; while (need_new_LTP) ; send_attach = TRUE; // Flag for the test port while (send_attach) { // Wait for the port to complete if ((!untested[test_port]) || (!in_control)) { // If the port has shut down for some reason or on bus reset… send_attach = FALSE; port_under_test[test_port] = FALSE; release_bus = TRUE; while (in_control) ; return; } } release_bus = TRUE; while (in_control) ; port_under_test[test_port] = FALSE; return; } } else { collision_count = 0; send_attach = FALSE; } }"				
289		Colin Whitby-Strevens	Min_port_speed was deleted from the port register map during SCAT review. This comment needs to be updated to reflect this decision.	432			
289		Colin Whitby-Strevens	#define autocrossover_supported TRUE	433			
289		Colin Whitby-Strevens	delete - replaced by PMD service.	434			
289		Colin Whitby-Strevens	delete - replaced by PMD service	435			
289		Colin Whitby-Strevens	delete - replace by PMD service	436			
290		Colin Whitby-Strevens	move to PMD services	437			
290		Colin Whitby-Strevens	if (Beta_mode) { bport_active = FALSE; PMD_CONTROL_request(PMD_UNSELECT_PORT, 0); } else if (!Beta_mode_only_port) tpBias(GND); // Drive TpBias low"	438			
290		Colin Whitby-Strevens	add comment // also ensures handshake times for both modes	439			
291		Colin Whitby-Strevens	PMD_CONTROL_request(PMD_TONE_ON, 0);"	440			
291		Colin Whitby-Strevens	PMD_CONTROL_request(PMD_TONE_OFF, 0);"	441			
291		Colin Whitby-Strevens	sending_tone = FALSE; PMD_CONTROL_request(PMD_TONE_OFF, 0);"	442			
291		James M. Skidmore	(Comment #5) Table 16-7, pg. 291, function toner For-statement incorrect. Change pg. 291 line 47 from: for (i = 0; i++; i < 3) { // send three bits or spaces to: for (i = 0; i < 3; i++) { // send three bits or spaces"	443			

Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
291		James M. Skidmore	(Comment #15) Table 16-7, pg. 291, function signal_detect_OK Eliminate possible race conditions with signal_detect_monitor, avoids setting sd_detected FALSE for a short period (which adversely affects other code which monitors this flag). Change line 30 from: if (x) sd_detected = FALSE; to: if (x) sd_detected = signal_detect;"	444			
291		James M. Skidmore	(Comment #16) Table 16-7, pg. 291, function toner.A suggestion for code simplification which (IMHO) better illustrates the intended purpose. Change lines 42-54 to: while (toning || send_speed) { t_ack = we_agree && send_speed; t_speed = send_speed ? (PHY.port_speed[pn] + 1) : 0; for (i = 0; i < TONE_INTERVAL; i = i + 1) { if (i == 0 || // start bit i == 1 && t_ack || // ack bit i >= 2 && i <= 4 && (t_speed & (1 << (i - 2)) != 0)) // speed bits send_tone; else wait_time(TONE_DURATION); wait_time(SPEEDCODE_BIT_INTERVAL); // inter-bit gap if (i == 4) { if (t_speed != 0) // speed code bits sent signal(EVT_SENT_SPEED); if (t_ack) // ack bit sent signal(EVT_SENT_ACK); } } }"	445			
292		Colin Whitby-Strevens	receive_speed_indication looks for a start bit. If it finds one, then it samples the next 6 bit positions and constructs “rs” which holds the decimal equivalent of the binary tones. If a start bit tone was followed by no speed encoding, then rs = 0 after the 6 samples. As a result, received_speed is set to -1 (received_speed = rs - 1;) and EVT_RECEIVED_SPEED is signaled. It may be argued that listening_for_speed will never be true unless both ends of a connection have already shifted into sending a speed_code. If so, then we should never run into this problem (i.e., at least one speed bit will always be set when we are listening). But the proof escapes me and it seems real implementations may end up sending a few empty tone frames before getting their speed signals out. Obviously correct solution would be to bracket the last two executable lines of received_speed_indication with if rs > 0 . That is, only calculate received_speed and trigger EVT_RECEIVED speed if some real speed bits were found.	446			

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292		Colin Whitby-Strevens	Insert PMD_CONTROL_request(PMD_SELECT_BPORT, port_speed);"	447			
292		James M. Skidmore	(Comment #6) Table 16-7, pg. 292, function receive_speed_indication For-statement incorrect. Change pg. 292 line 22 from: for (i = 0; i++; i < 6) { // now look for six speed code bits to:. for (i = 0; i < 6; i++) { // now look for six speed code bits"	448			
293		Colin Whitby-Strevens	Insert PMD_CONTROL_request(PMD_SELECT_BPORT, port_speed);"	449			
293		Colin Whitby-Strevens	insert PMD_CONTROL_request(PMD_SELECT_DS_PORT, 0); // true until a disconnection is detected"	450			
294		Colin Whitby-Strevens	Insert PMD_CONTROL_request(PMD_UNSELECT_PORT, 0); PMD_CONTROL_request(PMD_NO_CROSSOVER, 0);"	451			
294		James M. Skidmore	(Comment #17) Table 16-7, pg. 294, function connection_status Avoid race condition in transition to untested state. At pg. 294 line ~45, insert following just before return statement: while (!untested_state) // wait till in untested_state ;"	452			
295		Colin Whitby-Strevens	change to if (!sd_detected) { // final check just in case we don't need to crossover = !crossover; PMD_CONTROL_request(crossover ? PMD_CROSSOVER : PMD_NO_CROSSOVER, 0); }"	453			
296		Colin Whitby-Strevens	Insert PMD_CONTROL_request(PMD_UNSELECT_PORT, 0);"	454			
298		Colin Whitby-Strevens	standby target	455			
298		Colin Whitby-Strevens	See above Add void PH_EVENT_response(Boolean event_OK) { if (event_OK) missed_reset = FALSE; }.	456			
298		Colin Whitby-Strevens	The missed_reset signal is required to be cleared by the PHY/Link interface. It would be better done with a service. This comment is then changed to // PHY/Link interface is required to provide PH_EVENT_response of event_OK // to clear the missed_reset flag	457			

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
299		James M. Skidmore	(Comment #18) Table 16-7, pg. 299-300, function untested_actions Not enough time given for current S100 symbol (already in portT) to be transmitted; the data-prefix symbols may not be transmitted. At pg. 299 line ~3, insert following just after "portT.arg = ARB_STATE;" statement: wait_next_symbol(S100); The con_mgmnt_request signal should be set only when node is not already in control of bus. Change pg. 299 line 46 from: con_mgmnt_request = TRUE; // request the bus to: if (!in_control) con_mgmnt_request = TRUE; // request the bus The while-loop (waiting for node to gain control of bus) should exit when sync is lost. Change pg. 299 line ~48 from: while (!in_control && !seen_reset && !bport_sync_ok) { to: while (!in_control && !seen_reset && bport_sync_ok) { Need to clear port_under_test flag is attach-request received. At pg. 299 line ~43, insert following just after "untested = FALSE;" statement: port_under_test = FALSE; Need to make sure that port_under_test flag is cleared if we lose sync. At pg. 300 line ~13, insert following just before return statement: port_under_test = FALSE; If port becomes loop-disabled, need to ensure that flags are cleared and bus released. At pg. 300 line ~14, insert following just before "} // end of loop while untested": if (loop_disabled) { untested = FALSE; port_under_test = FALSE; release_bus = TRUE; return; } The untested_fault flag is redundant. Replace all occurrences of untested_fault with loop_disabled. Affects the P11:P12 transition in Figure 11-2, pg. 176, as well.	458			

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300		James M. Skidmore	(Comment #19) Table 16-7, pg. 300, function loop_disabled_actions In the P12: Loop-Disabled state, the port is inactivated (see activate_connect_detect). The port will continue to send tones in order to maintain connectivity with its peer port. The peer port, in turn, will lose synchronization, detect that it is no longer receiving a continuous signal, set its untested_fault flag and also transition into the P12: Loop-Disabled state. In order that the local port not immediately transition back into the P11: Untested state, the port must wait for its peer port to become inactive before exiting. At pg. 300 line ~23, insert the following just after the "activate_connect_detect(0);" statement: while (receive_ok && loop_disabled) ; // Wait 'til peer become inactive or loop_disabled flag is cleared.	459			
301		James M. Skidmore	(Comment #20) Table 16-18, pg. 301, function decode Decoding of DS arb states is dependent upon the arb control state-machine state. Change pg. 301 lines ~16-28 to: // Note: During tree-ID, it is possible to receive short periods of // RX_DATA_PREFIX, e.g., while in T1: Child_Handshake waiting for the // peer port to transition to the S0:Self_ID_Start state. switch(rx_arb) { case RX_DATA_PREFIX: return(DATA_PREFIX); case RX_DATA_END: return(PHY.PHY_state < S0) ? PARENT_HANDSHAKE : DATA_END); // RX_PARENT_HANDSHAKE is same as RX_DATA_END case RX_PARENT_NOTIFY: return(PHY.PHY_state < A0) ? PARENT_NOTIFY : REQUEST_CANCEL; // RX_REQUEST_CANCEL is same as RX_PARENT_NOTIFY case RX_SELF_ID_GRANT: return(PHY.PHY_state < A0) ? SELF_ID_GRANT : LEGACY_REQUEST; // RX_REQUEST is same as RX_SELF_ID_GRANT case RX_ROOT_CONTENTION: return(PHY.PHY_state < A0) ? ROOT_CONTENTION : GRANT; // RX_GRANT is same as RX_ROOT_CONTENTION case RX_IDENT_DONE: return(PHY.PHY_state < A0) ? IDENT_DONE : DISABLE_NOTIFY; // RX_DISABLE_NOTIFY is same as RX_IDENT_DONE case RX_IDLE: return(IDLE); case RX_BUS_RESET: return(BUS_RESET); case RX_CHILD_HANDSHAKE: return(CHILD_HANDSHAKE); case	461			

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			RX_SUSPEND: return(SUSPEND); }				
301		James M. Skidmore	(Comment #21).Table 16-8, pg. 301, function decode_bit Must ensure that received arb state is IDLE when in a transmit state. Change pg. 301 line from: new_signal = ds_portR; // Get signal to: if (PHY_state == S4 || PHY_state == TX || PHY_state == PH) new_signal.RX_arb = RX_IDLE; else new_signal = ds_portR; // Get signal"	462			
303		James M. Skidmore	(Comment #22) Table 16-9, pg. 303, function encode Add IDLE and DATA_PREFIX to case table. At line ~ 19, add the following: case IDLE: return(TX_IDLE); case DATA_PREFIX: return(TX_DATA_PREFIX);"	464			
304		Colin Whitby-Strevens	for (i = 0; i < (2<<DS_PHY_SPEED); i++) // Wait for 50 MHz clock wait_event(PH_DS_BIT_CLOCK);	465			
304		James M. Skidmore	(Comment #23) Table 16-9, pg. 304, function dsport_transmit_actions Typographic/spelling error in comment--change line ~8 from: } else { // tag == ARB_START to: } else { // tag == ARB_STATE When SPEED is transmitted, don't necessarily send data-prefix (e.g., during self-ID). Delete pg. 304 line ~22: ds_portTarb(TX_DATA_PREFIX); When DATA_END is transmitted, don't necessarily send dribble bits (e.g., null packet). Change pg. 304 line ~26 from: tx_dribble_bits(TX_DATA_END); to: if (ds_in_packet) tx_dribble_bits(TX_DATA_END);"	466			
306		Colin Whitby-Strevens	Consider the starting condition of fifo_rd_ptr = fifo_wr_ptr. This means the FIFO is empty, yet the code refuses to push onto the FIFO. The proper test should be: (FIFO_DEPTH + fifo_wr_ptr - fifo_rd_ptr) % FIFO_DEPTH < FIFO_DEPTH - 1 The left hand side is the expression for how many elements are currently in the FIFO, and the right-hand side is the maximum number of elements the FIFO can hold.	467			
306		James M. Skidmore	(Comment #24) Table 16-11, pg. 306, function push The if-statement condition is incorrect (it will not evaluate to TRUE if the fifo_rd_ptr is equal to the fifo_wr_ptr, I.e., the FIFO is empty). Change pg. 306 line ~54 from: if (((fifo_rd_ptr-fifo_wr_ptr + FIFO_DEPTH) % FIFO_DEPTH) > 1) { to: if (((fifo_rd_ptr - fifo_wr_ptr + FIFO_DEPTH - 1) % FIFO_DEPTH) >= 1) {"	468			

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308		Colin Whitby-Strevens	case 0b111: localR.tag=ARB_REQUEST; rxrequest.async=BORDER; break;	469			
308		James M. Skidmore	(Comment #25) Table 16-11, pg. 309, function rx_character Parentheses required (as written, rx_scram_ctrl is ex-or'ed with just one bit of descram). Change pg. 309 line 27 from: rx_control=(rx_scram_ctrl^((descram&0x80)>>4) | ((descram&0x20)>>3) | ((descram&0x8)>>2) | (descram&0x2)>>1); to: rx_control=(rx_scram_ctrl^(((descram&0x80)>>4) | ((descram&0x20)>>3) | ((descram&0x8)>>2) | ((descram&0x2)>>1)); For aesthetic consistency with other code, change line 34 from: } else if((rx_scram_req=rx_comma_decode(character_in, rx_rd))>=0 && !pkt) { to: } else if(((rx_scram_req=rx_comma_decode(character_in, rx_rd))>=0) && !pkt) {"	470			
309		Colin Whitby-Strevens	Notice the use of pkt and pkt_prefix. Requests are only expected when we aren't inside a packet (pkt) and when we aren't expecting a packet to begin (pkt_prefix). Data is the logical inverse … we are in a packet or expecting one to begin. But comma is a little strange … the code implies we expect a comma sometimes when we are in pkt_prefix (since we only ignore the comma inside of actual data). Why isn't comma detection restricted in the same fashion as request types (since commas can only be inserted in a string of requests)? And if it does no harm to detect commas during the packet prefix, why not detect during "data" as well?"	471			
310		James M. Skidmore	(Comment #26) Table 16-11, pg. 310, function train_character_sync The rx_bits variable must be kept to just 16-bits of significant data. Change pg. 310 line 29 from: rx_bits = rx_bits << 1;.to: rx_bits = (rx_bits << 1) & 0xFFFF;"	472			
310		James M. Skidmore	(Comment #27) Table 16-11, pg. 310, function rx_sync_lost_actions The char_check variable must be initialized prior to calling the character_sync function. Add following at pg. 310 line 55 just after "rx_rd=negative_rd;" statement: char_check = 0; // initialize char_check count"	473			

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311		James M. Skidmore	(Comment #28) Table 16-11, pg. 311, function scrambler_sync_actions The check for inverted polarity (by looking for either of two special characters) also requires that the rx_req_code variable be TRUE (i.e., the characters are request codes). Change pg. 311 line 28 from: } else if((rx_req == 0xF8) || (rx_req == 0x98)) { to: } else if(((rx_req == 0xF8) || (rx_req == 0x98)) && rx_req_code) {"	474			
313		James M. Skidmore	(Comment #29) Table 16-11, pg. 313, function bport_receive_actions Incrementing of the pad_count variable is incorrect. Change pg. 313 line 21 from: if (pad_count==rx_speed_ratio) pad_count=0; else pad_count++; to: pad_count = (pad_count + 1) % (1 << rx_speed_ratio);"	475			
314		Colin Whitby-Strevens	Insert:-case BORDER: async_part=0b111; break;	476			
316		James M. Skidmore	(Comment #30) Table 16-12, pg. 316, function bport_transmit_actions Extraneous spaces in comment. Change pg. 316 line 5 from: int tx_speed_ratio; // number of symbols per byte for given pkt_ speed and port_ speed to: int tx_speed_ratio; // number of symbols per byte for given pkt_speed and port_speed"	477			
318		James M. Skidmore	Table 16-14, pg. 318, function send_control Control symbols should be sent to active ports only. Change pg. 318 line 28 from: if (Beta_mode[i]) { to: if (active[i] && Beta_mode[i]) { and change line 35 from: if (out_of_packet && i != not_to_port && Beta_mode[i]) { to: if (out_of_packet && i != not_to_port && active[i] && Beta_mode[i]) {"	478			
318		James M. Skidmore	(Comment #32) Table 16-14, pg. 318-319, function start_tx_packet I don't think data-prefix padding following speed-signal sequence is correct. The fork process is unnecessary and doesn't really accomplish the goal of ensuring enough deletable symbols when a cycle-start symbol is to be sent. The min_OK_port_speed variable is unnecessary (symbol stretching/padding is done at the pkt_speed). I suggest the following. Delete all references to min_OK_port_speed. Change pg. 319 lines 19-55 from: fork … join to: #define MIN_DATA_PREFIX_TX 180 // Per 1394a, min data-prefix time preceding packet data // (SPEED_SIGNAL_LENGTH +	479			

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			DATA_PREFIX_HOLD + 40) if (sent_cycle_start) wait_next_symbol(min_operating_speed); for (i = 0; i < NPORT; i = i + 1) { if (speed_OK[i]) { portTarb(i, DATA_PREFIX); // Ensures DS ports get data-prefix. if (!((pkt == LEGACY) && (link == LEGACY_LINK) && (pkt_speed == S100))) portTspeed_general(i, pkt_speed, pkt); } else portTarb(i, DATA_NULL); } wait_next_symbol(pkt_speed); // Wait till speed-sig symbol completed. for (i = 0; i < NPORT; i = i + 1) // Now send the next symbol on the Beta mode ports. if (Beta_mode[i]) portTarb(i, speed_OK[i] ? DATA_PREFIX : DATA_NULL); // Ensure timing for starting packet format, plus timing for deletable symbols. The // requirement is that the originating node shall ensure that there is at least 17ns // of deletable symbols at the start of each packet since the last deletable symbol // was transmitted. The following code achieves this conservatively. Optimized // implementations which recognize that deletable symbols have already been // transmitted and reduce the time here accordingly are compliant. if (pkt == LEGACY) { // Leave the speed signal for longer, send the next symbol on the DS ports. wait_time (SPEED_SIGNAL_LENGTH - symbol_time(rx_speed)); for (i = 0; i < NPORT; i = i + 1) // Harmless writing this to the beta mode ports as well! portTarb(i, speed_OK[i] ? DATA_PREFIX : DATA_NULL); wait_time (convert(MIN_DATA_PREFIX_TX + DELETABLE_SYMBOL_TIME, pkt_speed) - SPEED_SIGNAL_LENGTH); } else { wait_next_symbol(pkt_speed); wait_time (convert(DELETABLE_SYMBOL_TIME, pkt_speed)); }.				
319		Colin Whitby-Strevens	insert accelerating = TRUE;	480			
320		James M. Skidmore	(Comment #33) Table 16-14, pg. 320, function stop_tx_packet Must add 20 ns to end time to account for dribble bits on DS ports. Change pg. 320 line 20 from: if (pkt == LEGACY) wait_time(hold_time); to: if (pkt == LEGACY) wait_time(hold_time+20); // account for dribble bits on DS ports"	481			
320		James M. Skidmore	(Comment #34) Table 16-15, pg. 320, function portR_next_arb I don't think the “if (packet_ending[port_num]) { … }” is needed.	482			

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320		James M. Skidmore	(Comment #35) Table 16-15, pg. 320-321, function wait_fifo_fill_time I don't think this function is correct (or even necessary). The requirement is that we wait at least 17 ns so as to guarantee that the rx FIFO won't underflow. To accomplish this, we need merely wait a couple of S100 tics. This function could simply be replaced with: wait_time(20);"	483			
321		James M. Skidmore	(Comment #36) Table 16-15, pg. 321, function start_rx_packet Just as in 1394a, this function does not correctly handle the case of multiple received speed-signals (still a possibility). I suggest the following to replace the start_rx_packet function in its entirety. The wait_Betaport_event function can be eliminated. #define MIN_DATA_PREFIX_RX (SPEED_SIGNAL_LENGTH + DATA_PREFIX_HOLD) void start_rx_packet() { // Send data prefix and do speed signaling // receive on DS or Beta, repeat to both int i; ArbState arb; Boolean data_started; // actual data now in rx fifo arb_timer = 0; if (!DS_stuck) { max_beta_timer = 0; // Timer only needs to be implemented in border capable nodes, DS_stuck = TRUE; // and note that this will have to be released by sending // a Legacy format packet. } portTarb(receive_port, IDLE); // Immediately send idle on the receive port // (i.e., remove grant, if any). data_started = FALSE; // no data yet format = LEGACY; // Assume legacy format until proven otherwise. // Wait for data to begin. While waiting, process any speed-signaling received or // any gap.events (subaction gap or arb-reset gap) which occur. // Upon entry into start_rx_packet, the incoming arb state on the receive_port // will be either DATA_PREFIX, DATA_NULL, or SPEED. If receive_port is a DS port, // then the arb state will be DATA_PREFIX. // Also ensure that for legacy packet the min data-prefix requirements are met. while (!data_started || (arb_timer < convert(MIN_DATA_PREFIX_RX, rx_speed) && format == LEGACY)) { arb = portRarb[receive_port]; // Process any gap events which may have occurred. if (send_async_start_token || arb_reset) begin gap_repeat_actions(FALSE); // This may or may not advance one S100 symbol. portTarb(receive_port, IDLE); // Restore ports to previous state. tx_control(DATA_PREFIX, r,eceive_port); // end // Now process the last arb state read from	484			

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
			rx fifo. if (data_started) // If data already started, then we must just be killing ; // time till enough data-prefix sent. else if (arb == SPEED) { rx_speed = portRspeed[receive_port]; format = current_pkt[receive_port]; tx_control(DATA_PREFIX, receive_port); // Take care of DS ports, which must set // the DP before the speed-signal is sent // (but no harm to Beta-mode ports). advance_OK[receive_port] = TRUE; // Allow next symbol to be read from rx FIFO. // Note: There must necessarily be another symbol in the rx FIFO by the time // the following processing completes. // Repeat the speed signal. for (i = 0; i < NPORT; i = i + 1) if (i != receive_port && active[i]) { speed_OK[i] = (rx_speed <= port_speed[i]) && (Beta_mode[i] || format == LEGACY); // Do not repeat Beta format packets on DS ports! if (speed_OK[i]) portTspeed_general(i, rx_speed, format); // format only needed for Beta-mode ports else portTarb(I, DATA_PREFIX); } wait_next_symbol(rx_speed); // Wait for speed symbol/DP to be sent. // Now send next symbol on Beta-mode ports. for (i = 0; i < NPORT; i = i + 1) if (i != receive_port && Beta_mode[i]) portTarb(i, DATA_PREFIX); if (format == LEGACY) { // Extend the speed signal. wait_time(SPEED_SIGNAL_LENGTH - symbol_time(rx_speed)); // Now send next symbol on DS ports. for (i = 0; i < NPORT; i = i + 1) if (i != receive_port) portTarb(i, DATA_PREFIX); // Harmless writing this to beta-mode ports as well! // Advance to next symbol boundary beyond MIN_DATA_PREFIX. wait_time(convert(MIN_DATA_PREFIX, rx_speed) - SPEED_SIGNAL_LENGTH); } else wait_next_symbol(rx_speed); // Wait for DP/DN symbol to be sent. } else if (arb == DATA_BYTE) data_started = TRUE; // Exit loop (when enough DP). else if (arb == DATA_PREFIX || arb == DATA_NULL) { tx_control(arb, receive_port); // Repeat the arb state. advance_OK[receive_port] = TRUE; // Allow next symbol to be read from rx FIFO. }.else return; // There's no packet, so bomb out. } tx_speed = rx_speed; wait_time (20); }"				
323		Colin Whitby-Strevens	byte read_phy_reg(int page, int port_num, int reg, Boolean base_reg); // Not defined in C code"	485			

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
323		Colin Whitby-Strevens	phy_resp_pkt.data = read_phy_reg(page, port_num, reg, ext_type == 1);"	486			
324		James M. Skidmore	Table 16-16 function decode_phy_packet Must process only received self-ID packets. Change pg. 324 line 18 from: if (!Beta_mode[receive_port] || !received_speed_signal) { // originated from node with Legacy link or DS node to: if (receive_port < NPORT && (!Beta_mode[receive_port] || !received_speed_signal)) { // originated from node with Legacy link or DS node Setting of senior_border and senior_port variables should only be done after transmission of own self-ID. Change pg. 324 line 26 from: if (Beta_mode[receive_port]) { to: if (Beta_mode[receive_port] && PHY_state == RX) { Brackets needed. Change pg. 324 lines 45-49 from: else if (phy_pkt.ext_type == 0xF) // Resume packet? … else if (phy_pkt.ext_type == 0xE) { // LTP packet? to: else if (phy_pkt.ext_type == 0xF) { // Resume packet? … } else if (phy_pkt.ext_type == 0xE) { // LTP packet?"	487			
325		James M. Skidmore	(Comment #38) Table 16-17, pg. 325, function data_coming Data coming is also indicated by reception of DATA_NULL (see also process_requests, which treats DATA_NULL the same as DATA_PREFIX, and sets the in_packet flag, which halts auto increment of the rx FIFO). Change pg. 325 line 54 from: if ((portRarb[i] == DATA_PREFIX) || (portRarb[i] == SPEED)) {.to: if ((portRarb[i] == DATA_PREFIX) || (portRarb[i] == DATA_NULL) || (portRarb[i] == SPEED)) {"	488			
326		James M. Skidmore	(Comment #39) Table 16-17, pg. 326, function arb_OK If con_mgmnt_request is set, then initiate asynchronous arbitration, similar to the isbr flag. At pg. 326 line ~34, insert the following just before "else if (breq == PRIORITY_REQ)": else if (con_mgmnt_request) own_request = async_arb_OK;	489			

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
327		James M. Skidmore	(Comment #40) Table 16-18, pg. 327, function bestReq Parentheses required to group elements correctly (> operator higher priority than & operator). Change pg. 327 lines 10-12 from: *in_phase_isoch_request = (iso_cycle && (best_req.isoch & *ipm > ISOCH_NONE & *ipm)); *in_phase_async_request = (!iso_cycle && (best_req.async & *apm >= CURRENT & *apm)); to: *in_phase_isoch_request = (iso_cycle && ((best_req.isoch & *ipm) > (ISOCH_NONE & *ipm))); *in_phase_async_request = (!iso_cycle && ((best_req.async & *apm) >= (CURRENT & *apm)));"	490			
328		James M. Skidmore	(Comment #41) Table 16-18, pg. 328-329, function boss_end_packet_actions When granting link, need to set the grant_self flag as well as the link_concatenation flag. At pg. 328 line 51 and pg. 329 line 36 (2 places), just after the "*link_concatenation = TRUE;" statement and before the "return;" statement, insert: grant_self = TRUE;"	491			
330		James M. Skidmore	(Comment #42) Table 16-18, pg. 330, function gap_repeat_actions The token_receive_port variable must be reset when done. At pg. 330 line 15, just before the terminating }, insert: token_receive_port = NPORT;	492			
332		Colin Whitby-Strevens	insert accelerating = TRUE;	493			

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
334		James M. Skidmore	(Comment #43) Table 16-19, pg. 334-335, function process_requests Typo in comment, line 52, change from: // flag to ignore the test of the packet to: // flag to ignore the rest of the packet The in_packet flag should only be set after we've passed tree-ID because it's possible to get data-prefix arb state on DS ports during tree-ID, but it doesn't indicate the start of a packet. Also, DATA_NULL can indicate the end of a packet as well as the start so set packet_ending flag if DATA_NULL received if in_packet already set. Change pg. 334 lines 54-55 from: if (!in_packet[i]) in_packet[i] = TRUE; // throttle the FIFO else next_arb[i] = TRUE; // signal that this is the latest to: if (!in_packet[i] && PHY_state >= S0) in_packet[i] = TRUE; // throttle the FIFO else { next_arb[i] = TRUE; // signal that this is the latest if (portCurrent`arb == DATA_NULL) packet_ending[i] = TRUE; } The received_speed_signal must be maintained 'til end of packet so that decode_phy_packet can use it. At pg. 335 line 16 and line 37 (2 places), delete: received_speed_signal = FALSE;	494			
337		Colin Whitby-Strevens	As above The missed_reset signal is required to be cleared by the PHY/Link interface. It would be better done with a service. This comment could then be changed to // PHY/Link interface is required to provide PH_EVENT_response of event_OK // to clear the missed_reset flag	495			

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
339		James M. Skidmore	(Comment #10) Table 16-21, pg. 339, function tree_ID_start_actions Child ports are not always marked as child ports. Consider the case of a node receiving PARENT_NOTIFY on all active ports (the node should become root). As written, the code will not mark the last active port as a child, causing an unnecessary root-contention cycle. The code that checks the child count should be moved outside of the for loop. I suggest the following. Change pg. 339 lines 11-24 from: do { … } while (!(reset_detected() || ibr || isbr|| arb_timer == CONFIG_TIMEOUT)); to:. do { children = 0; // Count the kids afresh on each loop for (i = 0; i < NPORT; i = i + 1) if (!active[i] || portRarb[i] == PARENT_NOTIFY) { child[i] = TRUE; // Child if disabled, disconnected, suspended, children++; // or if other PHY asks us to be parent. } if (children == NPORT - 1 && (!force_root || arb_timer >= FORCE_ROOT_TIMEOUT)) return; // Only one port left as the parent. else if (children == NPORT) return; // We are the root. } while (!(reset_detected() || ibr || isbr|| arb_timer == CONFIG_TIMEOUT));"	496			
340		James M. Skidmore	(Comment #7) Table 16-22, pg. 340, function self_ID_start_actions The lowest_unidentified_child variable is not computed correctly (its always comes out as the lowest numbered child port). Change pg. 340 lines 13-20 from: for (i = 0; i < NPORT; i++) { if (child_ID_complete[i]) // Tell identified children to prepare to receive data portTarb(i, DATA_PREFIX); else portTarb(i, IDLE); // Allow parent to finish } for (i = 0; i < NPORT; i++) if (child[i] && active[i]) { // If active child if (all_child_ports_identified) lowest_unidentified_child = i; all_child_ports_identified = FALSE; } to: for (i = 0; i < NPORT; i = i + 1) if (child_ID_complete[i]) // Tell identified children to prepare to receive data. portTarb(i, DATA_PREFIX); else { portTarb(i, IDLE); // Allow parent to finish if (child[i] && active[i]) { // If active child if (all_child_ports_identified) lowest_unidentified_child = i; all_child_ports_identified = FALSE; } }	497			

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
342		James M. Skidmore	(Comment #8) Table 16-22, pg. 342, function self_ID_transmit_actions If node is a border node, the starting assumption is that it's the senior_border and that there's NO senior_port. Change pg. 342 line 11 from: senior_port = parent_port; // working assumption, may be changed later to: senior_port = NPORT; // working assumption, may be changed later"	498			
343		Clay E Hudgins	p. 343, line 5-6. “I'm boss” seems too casual.	499			
346		Colin Whitby-Strevens	restriction to outside the isochronous cycle is wrong. did_arbrst = FALSE; // only relevant to a B_bus	500			
346		James M. Skidmore	(Comment #44) Table 16-23, function idle_actions, pg. 346 Parentheses required to group elements correctly (== operator is higher priority than ? operator). Change pg. 346 lines 10-11 from: if (!OK_to_grant && proxy_root && (arb_timer == STORES_GAP_COUNT ? subaction_gap: BOSS_RESTART_TIME)) { to: if (!OK_to_grant && proxy_root && (arb_timer == (STORES_GAP_COUNT ? subaction_gap: BOSS_RESTART_TIME))) {	501			

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
347		James M. Skidmore	(Comment #9) Table 16-25, pg. 347-348, function transmit_actions The immediate_request variable is used later in the function and should not be set FALSE until then. Delete pg. 347 line 38: immediate_request = FALSE; The code does not correctly reset an immediate request from a legacy link. Move pg. 348 line 7 immediate_request = FALSE; to immediately before the while statement at pg. 348 line 15. The while loop which processes the data_to_transmit from the link does not quantize /stretch the data-prefix symbols when PH_REQ_HOLD is indicated by the link (all symbols transmitted in a packet from the speed-signal sequence to the terminating ending symbols must be stretched or padded according to the packet speed). I suggest the following. Change pg. 348 lines ~16-21 from: do { // Wait for data or release from the link wait_event(PH_BYTE_CLOCK); // intended to synchronize with clock PH_CLOCK_indication(); data_to_transmit = waitPH_DATA_request(); } while (data_to_transmit.reqType == PH_REQ_HOLD); // Hold only valid before data starts if (data_to_transmit.reqType == PH_REQ_DATA) { to: // Wait for data or release from the link waitPH_DATA_request(data_to_transmit); if (data_to_transmit`DreqType == PH_REQ_HOLD) { // Hold only valid before data starts PH_CLOCK_indication(); wait_next_symbol(tx_speed); } else if (data_to_transmit`DreqType == PH_REQ_DATA) { NOTE: An alternative is to change the portTarb function so that the packet speed is maintained (once determined) instead of changed to DEFAULT so that the tx_character function does the character stretching/padding automatically.	502			

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Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
348		Colin Whitby-Strevens	Hold protocol is not used for concatenated isochronous packets from beta link. Change to } else if (data_to_transmit.reqType == PH_REQ_DATA_PREFIX) { // concatenated packets from Legacy link end_of_packet = link_concatenation = TRUE; // End of packet indicator stop_tx_packet(DATA_NULL, tx_speed, CONCATENATION_PREFIX_TIME, tx_format, NPORT); // MIN_PACKET_SEPARATION req_speed = data_to_transmit.speed; } else if ((data_to_transmit.reqType == PH_REQ_SUBACTION_END) ||"	503			
350		James M. Skidmore	(Comment #45) Table 16-26, pg. 349-351, function receive_actions The receive_speed_signal needs to be cleared at end of processing. At pg. 350 line 52, just before the "return;" statement and at pg. 351 line 17, just before the "}" (2 places), insert: received_speed_signal = FALSE;"	504			
353		Gene Milligan	"Test methodology for 1394 bulk serial bus cable" appears to be formatted as a sentence. But it is not a sentence. Suggested Remedy = Make it a sentence that states something informative. Also mark Annex A as Informative or as Normative. The other Annexes should also be noted as informative or as normative.	505	E	CWS	Accepted
355	12 - 13	Clay E Hudgins	Use of "should" seems inconsistent with formal definition.	506	E	CWS	Accepted

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Completed technical issues

Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
1		Burke Henehan	Technical Comment In the IEEE P1394a draft there is a section called: "Clarifications and Corrigenda". I would propose that a similar section be placed in 1394b for clarifications and corrigenda to P1394a. I have one item for this: In paragraph 10.25 "Configuration ROM Bus_Info_block" in about the 5th paragraph (pg. 160 in draft 4.0) it starts: The max_rec field … It goes on to say this field applies to block write requests, block read responses, and asynchronous stream packets addressed to the node. I believe it is overly restrictive to include asynchronous stream packets in the definition of max_rec field. Link implementations may have different internal FIFOs for receiving stream packets and asynchronous packets allowing more flexible operation. I believe this field should only be for asynchronous block packets. I propose removing the words "or asynchronous stream packets addressed to the node". Suggested Remedy = I propose removing the words "or asynchronous stream packets addressed to the node" from the line talking about what the max_rec parameter represents.	4	T		Rejected This appears to be a comment on IEEE Std 1394a-2000 and, as such, is out of scope of the PAR for IEEE P1394b.
1		Kiyoshi Miura	IEEE1394 was intended to realize a low cost high performance bus	6	T		Rejected See footnote.[1]

[1] "P1394b is not low cost" – opinions vary

"P1394b should concentrate in higher speed (S800 and higher)" – the PAR does not give us this option

"Therefore the standard should relinquish low speed specifications of POF and UTP and bilingual port." – the PAR requires bilingual ports and backwards speed compatibility, the PAR requires long-haul cabling, the marketplace is already experimenting with UTP and POF for 1394 -- this standard rationalizes and integrates these media with the rest of 1394

?? "This makes P1394b standard simple and clear" – Granted, but it also make P1394b much less interesting to important segments of the marketplace and allows alternative media to grow incompatible 1394 solutions. ?? "Then P1394b compliant device can be made in low cost" – not if POF or UTP interconnect is put into a home or studio-wiring scheme. The protocol translators will get very expensive. ?? "POF and UTP specifications are also failed in a basic principle of IEEE1394 in which a cable must support all speeds defined in the standard. Legacy 6-pin and 4-pin cables meet this principle" – The all speeds requirement is there to avoid color-coding cables and connectors, etc. POF and UTP do not use the standard 1394 connector thus there is no confusion in the usage model about what to expect of device performance. ?? "Since POF for a high-speed transmission is still emerging technology, we had better to leave 1394 over POF for future standardization activity" – Experts contributing to the P1394b meetings felt competent to specify POF behavior and it was duly voted into scope. ?? "Bilingual operation dose not seem beneficial to end-users" – The PAR requires bilingual operation. Incidentally, this was a well-debated issue and the industry representatives present felt strongly that it was important. It was repeatedly voted into scope. ?? "When legacy (DS S400 or slower) nodes and P1394b nodes exist on the same bus, the bus performance will be degraded severely" – Partitioning the system

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			interface. However, P1394b seems failed to meet this concept. This is my main reason to vote negative. The following explains more specifically. P1394b should concentrate in higher speed (S800 and higher). Therefore the standard should relinquish low speed specifications of POF and UTP and bilingual port. This makes P1394b standard simple and clear. Then P1394b compliant device can be made in low cost. POF and UTP specifications are also failed in a basic principle of IEEE1394 in which a cable must support all speeds defined in the standard. Legacy 6-pin and 4-pin cables meet this principle. Since POF for a high-speed transmission is still emerging technology, we had better to leave 1394 over POF for future standardization activity. Bilingual operation dose not seem beneficial to end-users. When legacy (DS S400 or slower) nodes and P1394b nodes exist on the same bus, the bus performance will be degraded severely. And bilingual port and border function becomes quite complicated and costs. Complicated operations also mean that interoperability gets more difficult to assure. One of practical way, I think, is to separate the bus into a legacy (1994 and/or P1394a) bus and a P1394b bus, which are connected through a bridge. P1394b utilizes different connectors so that there is no chance to be confused by end-users. Other specific comments to the draft are described in a separate document of gCommentByKiyoshi.pdf has annotation produced				

into beta clouds and A clouds, etc., help performance a great deal. This was the driving force in defining border node behavior. Try it you'll like it! ?? "And bilingual port and border function becomes quite complicated and costs" – It's worth the pain. ?? "Complicated operations also mean that interoperability gets more difficult to assure" – That's why GOD gave us engineers ?? "One of practical way, I think, is to separate the bus into a legacy (1994 and/or P1394a) bus and a P1394b bus, which are connected through a bridge. P1394b utilizes different connectors so that there is no chance to be confused by end-users." – Our PAR didn't give us the option of waiting for P1394.1 to do its job. Backward compatibility at the copper level was and is a requirement.

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			by Acrobat 4.05 which is sent to David R. Wooten by email.				
25		Kiyoshi Miura	IEEE1394 was intended to realize a low cost high performance bus interface. However, P1394b seems failed to meet this concept. This is my main reason to vote negative. The following explains more specifically. P1394b should concentrate in higher speed (S800 and higher).	20	T	EH	Rejected See essentially identical comment from balloter on page one (BRAT ID 4). See also footnote.[2]

[2] The balloter does not indicate what attributes of this standard make it not low cost. Many people on the committee think that the interface described by this standard is low cost.

The PAR for this standard included making provisions or longer haul operation over things like fiber. Also, the PAR requires that this standard make provisions for plug compatibility with 1394-1995 and 1394a. We have taken this to mean that it must be possible to plug a 1394-1995 or 1394a compliant device into a device that is compliant with this standard and they must interoperate.

This standard does make provisions for a device to only support the new signaling so not all devices are required to be bilingual.

During the discussion of the committee that lead up to a vote on the minimun speed to be supported on 4.5M copper connection, the consensus of the group seemed to be that the additional cost of supporting the lower signaling rates in Beta mode was insignificant and added virtually no cost to the devices.

Not all devices are required to support all speeds. A node that only attaches to POF is allowed to be designed to support only beta mode and only the speeds at which the fiber is capable of operating. There is no extra expense for other speeds or other signaling methods.

Again, the PAR required that the group look at longer haul media such as fiber.

It should be noted that the existing 6-pin and 4-pin cables are not capable of supporting the higher speeds defined in this standard. This is why a new connector had to be defined for nodes running in Beta mode.

After significant study, the BRC has concluded that it is in partial agreement with this reviewer on the issue of POF in the standard. Graded-index fiber as defined in the standard is not intermateable with the stepped-index fiber that uses the same connector scheme. This would create use confusion. Additionally, the use of graded-index fiber is not as mature as is stepped-index and glass fiber. For these reasons, the graded-index fiber was removed from the standard. However, since both glass fiber and stepped-index fiber have been deployed for several years, the BRC feels that they should remain in the standard.

We don't understand why the reviewer states that the ability to use existing equipment without modification and without using an additional protocol translater is not beneficial to the end user. The BRC thinks that this is very beneficial to the end user which is one of the reasons that this attribute was included in the PAR.

There is no requirement in this specification for a node to support bi-lingual operation. It is felt by man on the committee that a popular device will be a two port border node that is only DS on one side and only Beta mode on the other. This is not a complex part.

The performance of the network when operating with both Beta mode and DS devices is no worse that the performance when all devices are DS. We take this statement that the performance will be "degraded seriously" as a statement that the Beta mode operation is much more efficient than is DS operation. We concur with this.

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			Therefore the standard should relinquish low speed specifications of POF and UTP and bilingual port. This makes P1394b standard simple and clear. Then P1394b compliant device can be made in low cost. POF and UTP specifications are also failed in a basic principle of IEEE1394 in which a cable must support all speeds defined in the standard. Legacy 6-pin and 4-pin cables meet this principle. Since POF for a high-speed transmission is still emerging technology, we had better to leave 1394 over POF for future standardization activity. Bilingual operation dose not seem beneficial to end-users. When legacy (DS S400 or slower) nodes and P1394b nodes exist on the same bus, the bus performance will be degraded severely. And bilingual port and border function becomes quite complicated and costs. Complicated operations also mean that interoperability gets more difficult to assure. One of practical way, I think, is to separate the bus into a legacy (1994 and/or P1394a) bus and a P1394b bus, which are connected through a bridge. P1394b utilizes different connectors so that there is no chance to be confused by end-users.				
37	19	Clay E Hudgins	"and reject reserved code values." Since p. 33 line 43/37 requires that reads of reserved values return zero, it follows that you mean "and reject reserved code values by interpreting them as zero." It would be more clear if you would elaborate here that you mean for these to be interpreted as zero.	51	T	PJ	Rejected Because the originator of a defined field likely expects the field to have an effect, the recipient may not interpret reserved values in defined fields as if they were zero.

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61	14	Steven R Bard	SC (status contact pin) reserved for future use. I would like to see the use of this pin expanded to implementations where the FOP is remote from the system. The signal pin would be used to connect the LinkOn signal from the FOP back to the PIL (or wherever it would be attached in the system). Discussions of the use of the SC pin to provide multiple bits of data for use in cable identification ended in futility and there is no indication that this single pin can be used successfully for cable identification under all implementations (isolation, for example). Allowing this pin to be used for vendor specific implementations extends the versatility of the PIL/FOP architecture beyond the fixed system."	163	T	MB	Rejected Vendor-dependent definition of connector pins is not advisable because it could compromise interoperability or safety.
63		David R Wooten	This looks the same as the Beta socket body.	164	T	MB	Rejected “Things are seldom what they seem…”
74		David R Wooten	When external labeling is present, it should be printed in contrasting color. The printing should be repeated every 0.5 meters and contain the following information: Labeling must not be mandatory.	167	T	MB	Rejected Strong consensus support in the cable task force for this labeling.
78	36 41	Steven R Bard	The standard should not preclude an implementation that does provide a connection to SC from plug to plug. Further, it should state that if a cable is constructed such that there is a connection to SC from plug to plug that the signal (if any) applied to this line be such that it does not provide any negative effects to the performance and parameters stated. It is anticipated that the FOP LinkOn signal would connect to the PIL side of an implementation.	171	T		Rejected See comment on page 61.
101		David R Wooten	The interface specification apply at the point of entry and exit from the equipment. The interface specifications may be 'valid' at other places.	191	T	EH	Accepted
102	25	Steven R Bard	So, what is technically wrong with connecting a 6-pin or 4-pin socket to a bilingual port on a PHY? It seems to me that there is nothing wrong with this, it just results in that port ONLY operating in DS mode. I can't think of a reason why, but, an OEM may want to do this. I think the text should state that Beta-only ports shall not… further, a bilingual port should not…	193	T	EH	Rejected The primary reason for this restriction is to avoid EMI from beta signals flowing over legacy cables and connectors. Consider the case of two devices having bilingual ports connected to 4-pin (6-)

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							sockets. When they interconnect the system will run in beta mode on legacy cables. This will cause EMI and poor interoperability at the electrical level. Without this explicit restriction my example will occur.
102		Steven R Bard	This is more of a comment to open discussion on short-haul CAT-5… For instance, a small inner office (cube) network - short CAT-5 cables connecting to my printer, scanner, etc. Do the electricals for long-haul CAT-5 have any issue when using CAT-5 for short haul?"	194	T	EH	Rejected This comment doesn't seem germane to this section.
109	37	Clay E Hudgins	"should" would probably best be replaced with "shall" here.	215	T	EH	Rejected Not permissible to use "shall" in an informative section.
111		Colin Whitby-Strevens	Jitter tolerance specs should be updated to leverage the latest FC know-how (see the latest FC-PI spec), in particular, jitter tolerance no longer includes an explicit random jitter element.	218	T	EH	Rejected on advice of balloter. No better know-how in FC specifications.
166	20	David R Wooten	This seems to be a repeat of table 10-12. If so, why is it needed here?"	270	T	CWS	Rejected
179	20	Kiyoshi Miura	This first sentence seems to contradict to the transition condition of "connected && !Beta_mode" in the state diagram(Fig.11-2).	289	T	CWS	Rejected The port can enter Resume from suspend. The description of Beta mode operation in Resume is correct.
181	50	Steven R Bard	Page 181 Line 50 & 51 specifically, I'm concerned about the text "…or another port already in standby." Me thinks this text is very misleading for this could never happen (presumably). In order for it to occur, it would assume that there would be an active port (from which the Standby PHY command packet would be received) and yet another port in Standby. I'm probably just a bit thick on this, however, I do not see how a node could have one active port and another port in Standby. I suggest the text I have quoted be stricken from the draft.	294	E	CWS	Rejected The condition described is possible, but the text requires revision.
226		Colin Whitby-Strevens	Bus holder initialization needs to be specified. This may also require changes to the normative part of this clause.	360	T	DRW	Rejected. Support for bus holders is neither mandatory or normative.

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250		David R Wooten	The value for MIN_PKT_SPACING is not defined in this spec.	397	T	MJT	Accepted. MIN_PKT_SPACING to be defined but MIN_PHY_PACKET_SPACING is redundant and eliminated.
250		Tadahiro Yoshida	The constants MIN_PKT_SPACING & MIN_PHY_PACKET_SPACING is not given anywhere in this chapter. Suggested Remedy =	399	T	MJT	
259	3	Junichi Takeuchi	"Since border functionality is a superset of Beta-mode-only operation, the detailed operations are only described for full border nodes." Beta-mode-only function would be easily achieved by getting DS function out of the border function. However, it (Beta mode, BOSS) is a new function, so I think it is better to describe Beta-mode-only C code to avoid misunderstandings by some LSI venders. Suggested Remedy = Beta-mode-only operation C code should be described in this specification.	407	T	MJT	Rejected. Although the requested C code would be useful, the existing C code is complete. Insufficient resources are available to the BRC to write and verify new C code.
274		Colin Whitby-Strevens	DS arbitration signals are overloaded, and the encodings do not reflect this These will have to be assigned numerical values to deal with the overloading"	415	T	CWS	Accepted. Process_req has been modified to use PHY_state to filter and resolve the overloading. And a caution about filtering of spurious RX_DATA_PREFIX indications has been added to dsport_rx.c. Also, RX_DATA_PREFIX kicks off the extract clock circuit and a stop clock detector is used to determine when to push the ending arb state into the FIFO.
274		Colin Whitby-Strevens	These will have to be assigned numerical values to deal with the overloading	416	T	CWS	
301		Colin Whitby-Strevens	This decode does not deal with the fact that arbitration line states are overloaded.	460	T	CWS	Accepted. See resolution for 415, 416.
303		Colin Whitby-Strevens	This needs to be modified to deal with the overloading of arbitration line states	463	T	CWS	Accepted. See resolution for 415, 416.

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Completed editorial issues

Page	Line	Balloter	Comment	ID	Type	Owner	Resolution
21	3	Brian Batchelder	The c-code function names are not hypertext in this version, although the page numbers are hyperlinked.	12	E	EH	Rejected Hyperlinks will not be in the published standard.
25	32 – 33	Clay E Hudgins	Is this parallel PHY/LINK interface an interface to the user/host, or are you specifying a parallel option to the serial bus itself? The term "PHY/LINK" is a bit cryptic to be used so early in the standard, without further explanation.	16	E	EH	Rejected PHY/link is a standard 1394-1995 term. It is expected that readers of this specification will have more than a passing knowledge of 1394
25		Gene Milligan	The abstract was not clear what this was a supplement to but I waited for the Scope. The scope has it to be a supplement to the base standard and a supplement to the amendment to the base standard. Seems complex. Suggested Remedy = Pray for a future project to Structure 1394 as a family of layered standards using parts (dash numbers) such that each part is a fully documented standard.	22	E	EH	Rejected However, balloter should inspect revised scope and purpose to see if they resolve his concern.
27		Brian Batchelder	Doublet is defined in Table 1-1 and in the glossary, but a text search showed that it is never used. The definitions should be removed.	27	E	EH	Rejected Although doublet is not used in the draft, it invites more questions if there is no definition for a 16-bit quantity in the table.
37		Clay E Hudgins	p. 37, line 5-6. The word "must" is used several times within the standard. I recommend you define "must" because it is unclear how strong "must" is relative to "should" and "shall".	52	E	DRW	Rejected "Must" is not to be used within the standard and therefore requires no definition.
38		Colin Whitby-Strevens	in	53	E	DRW	Accepted
38		Colin Whitby-Strevens	out of alphabetical order	54	E	DRW	Accepted
38		Colin Whitby-Strevens	Beta mode is not defined, but should be (DS mode is)	55	E	DRW	Accepted

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38		Clay E Hudgins	p. 38, line 26. In the term “B bus” the only element that is non-intuitive is the “B.” However, you neglect to spell out what “B” means in defining “B bus.” “… operating as a B PHY.” Arrrrrgggggghhhhhh!	57	E	DRW	Rejected: A "B bus" is as defined. Also, "B" is always a modifier. Each "B" modified thing is defined in the glossary. We don't believe that the references are circular.
38	31	Clay E Hudgins	It would help this reader a great deal if your definitions took the trouble to spell out what you mean by PHY and B.	58	E	DRW	Rejected There is a clear description of a PHY in the glossary. "B" is a modifier that, in general, means something that is operating in a way that is compliant with this specification. It does not necessarily denote Beta-mode. There is a subtle distinction between the use of Beta and B and we believe that we are consistent in the use so as to maintain specificity if not clarity.
38	52	Gene Milligan	“Bit stuffed” is used (e.g., in scope) but is not defined. Suggested Remedy = Define it.	59	E	DRW	Accepted in principle. Removed the reference to "bit-stuffed" in the Scope clause which is the only place it was used in the specification.
39	9	Steven R Bard	“…the node taking the arbitration” should be changed to “…the node making the arbitration…”	60	E	DRW	Accepted
40	25	Clay E Hudgins	Did “DS” stand for something at one point in time? Like Data Strobe? If so, please include in definition.	61	E	DRW	Accepted
42	4	Clay E Hudgins	Link seems to have a physical connotation in Figure 4-1. This definition does not seem to correlate with Figure 4-1.	62	E	DRW	Accepted. Expanded definition to include the physicla entity that implements the link layer.

43	54	Gene Milligan	<<PMD: Physical Media Dependent.>> Early standards used the acronym PMD for Physical Medium Dependent. ISO/IEC 11801 also uses Medium. Suggested Remedy = Change to Physical Medium Dependent for consistency.	63	E	DRW	Accepted
44		Colin Whitby-Strevens	In a B bus, the root, otherwise in a hybrid bus where the root is in a B cloud, the senior border in the B cloud containing the root (if the root is a Legacy node, then there is no proxy root)	65	E	DRW	Accepted
44	43 - 45	Steven R Bard	The definition of "resuming port" is rather biased. More specifically, it does not encapsulate the concept of a resume tone. I suggest words like: "observe bias or resume tone" and "generate bias or resume tone." Or at least some words that can be crafted to eliminate the bias of the definition to strictly DS operation.	66	E	DRW	Accepted
44	15	Gene Milligan	<<proxy_root: Iin a hybrid bus, the senior border in the cloud containing the root, otherwise (in a B bus)the root.>> In not Iin. Suggested Remedy = Correct In.	67	E	DRW	Accepted
46	8	Steven R Bard	"…both a physical cable disconnection." Both? Something is missing here and I don't recall what it is.	68	E	DRW	Accepted
56		MDJTeener	General note to all figures in Clause 5 … "all linear dimensions are in millimeters, tolerances are linear ±0.15 and angular ±5°, interpret dimensions and tolerances per ANSI Y-14.5M-1994" should be in one place and not clutter up each figure."	160	E	MB	Rejected Longer citation reduces chance of misinterpretation
101		MDJTeener	This general architecture figure and figure 6-2 should be consistent. Maybe the TP1 and TP4 in figure 6-2 should be relabeled.	189	E	EH	Accepted In figure 6-2, the boxes connected to TP1 and TP4 are to be labeled PHY.
104		Steven R Bard	Page 104 There are a lot of "NOTES" on this page. Is it true that every one of these "Notes" are an informative comment and NONE of them are to be normative?"	202	E	EH	Rejected They're all informative. If the reader were a gigabit communications expert every one of these notes wouldn't be needed – the expert would know what the specification meant
119	20	David R Wooten	There seems to be a font problem with the 't' in "worst".	226	E	MS	Rejected

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135	34	Clay E Hudgins	p. 135, line 35. Consider replacing “should” with another word, perhaps “must” if you choose to formally define “must.”	241	E	MS	Rejected This note is informative in its nature and thus can’t compel an implementer to comply with any applicable regulations.
154	3	David R Wooten	Given table 10-5 and 10-6, this table (10-7) seems redundant.	256	E	CWS	Rejected Although redundant, it is also useful, particularly so as it differs from equivalent tables for 8B10B published elsewhere which use the opposite bit ordering.
160	53	Steven R Bard	Weren't all references to S3200 to be removed from this draft?"	259	E	CWS	Rejected No, only the electrical/optical specs. The logical functionality is included, as a basis for when an amendment can provide the missing pieces.
191		MDJTeener	Major organizational issue: the PHY/Link clauses cannot really be understood before the PHY services are defined, so I suggest that clause 15 be moved in front of the PHY/Link clauses, and each PHY/Link clause use the terminology defined in the services section of that clause. A possible choice would actually be to combine the two PHY/Link clauses into one"	336	E	EH	Accepted
233	1	MDJTeener	This really should be part of a common PHY services clause, isolating it here makes little sense.	365	E	EH	Rejected. The document organization is consistent with IEEE Std 1394a-2000

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Resolved kvetches

Page	Line	Baloter	Comment	ID	Type	Owner	Resolution
1		Gene Milligan	Getting an Email per comment is not friendly Suggested Remedy = Come up with a better form for the web page.	7	K		Rejected Balloter should address process comments to the IEEE.
4	3 - 13	Gene Milligan	This comment is offered to the IEEE SA and is not addressed at 1394a. The second paragraph of the “standard” patent policy statement implies there is a singular patent and a singular holder requiring a singular license. This may not be the case. Suggested Remedy = I suggest that the IEEE consider in the future the “standard” ANSI patent statement with regard especially to the language when a patent has or patents have been identified.	9	K		Rejected As noted by the balloter, the comment is addressed to the IEEE Standards Association, not the BRC.

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