Cl **00** *SC* *P* *L* # **1**

Dallesasse, John — Emcore Corporation

Comment Type **T** *Comment Status* **X**

As drafted, the standard allows the existance of a ""compliant"" equalizer with adaptation times too slow to ensure stable operation in an office environment. Such an equalizer needs to be excluded from the ability to claim compliance to the standard, or the standard is broken. A dynamic receiver test is required.

Suggested Remedy

Add a dynamic test for the receiver. The suggested way to achieve such a test is based upon the block diagram in Figure 68-10. Rather than have a single ISI generator, the source signal from the combined gaussian noise generator and pattern generator is split and fed into two parallel ISI generators with fixed but different impulse responses. The output from these ISI generators are each fed into variable amplifiers whose gain is modulated at a frequency representative of the rate of change of the fiber modal distribution when subjected to the types of mechanical perturbations called out in GR-63-CORE or IEC 61300-2-1, 2nd Edition, 2003-01. The output from each amplifer combined, and fed into the pulse shaping filter and remaining blocks of Figure 68-10. The waveform type and phase relative to each other are chosen to preserve a constant normalized signal amplitude.

Response *Response Status* **O**

Cl **00** *SC* *P* *L* # **2**

Dallesasse, John — Emcore Corporation

Comment Type **TR** *Comment Status* **X**

Per the vote in the November, 2004 meeting, the group needs to: ""...demonstrate a 10-12 BER over the rated distance on a specified channel (TBD) and show interoperability between PMD's of at least three vendors for 10GBASE-LRM to support technical feasibility prior to sponsor ballot."" This has not been done. The precedent established in IEEE 802.3ae can be synopsized by an excerpt from Jonathan Thatcher's comment regarding this topic that was submitted during 802.3ae balloting: ""...Feasibility means that technology must be demonstrated with reports and working models; proven technolgy; reasonable testing and with confidence in reliability..."" The presentations made to the 802.3ae Task Force in October and November of 2001 set a reasonable bar for the 802.3aq Task Force. The work of the 802.3aq task force on this subject should also contain confirmation that equalizer adaptation times ensure link stability under conditions typical for standard office environments, such as those called out in GR-63-CORE or IEC 61300-2-1, 2nd Edition, 2003-01.

Suggested Remedy

An adaptation of Thatcher's suggested remedy applies here as well: Demonstrate the technical feasibility of the technology specified in Clause 68 while ensuring the attainment of the other 4 criteria. Or, change the requirements/specifications such that this goal can be achieved.

Response *Response Status* **O**

Cl **00** *SC* *P* *L* # **3**

Thaler, Pat — Agilent Technologies

Comment Type **T** *Comment Status* **X**

Is there a reason for not defining LWM, in other words, LRM combined with WIS as is done for the other 10GBASE-R PHYs?

Suggested Remedy

Add LWM or perhaps add a brief statement that the Clause 68 PMD does not support WIS.

Response *Response Status* **O**

Cl **00** *SC* *P* *L* # **4**

Lindsay, Tom — ClariPhy Communicati

Comment Type **E** *Comment Status* **X**

Readability and comprehension are challenged by the tight formatting. Currently, the reader is required to scan and jump several pages, in some cases, for table and figures that relate to document text.

Suggested Remedy

Structure the document so that all text, tables, and figures are contiguous within each subclause. I realize this might put some gaps and white spaces into the document, but it would really help readability.

Response *Response Status* **O**

Cl **00** *SC* *P* *L* # **5**

Law, David 3Com

Comment Type **E** *Comment Status* **X**

Strictly speaking the, as stated in the Editorial notes related to changed portions of the existing standard, the entire text of the editing instructions should be in bold italic font (see page 6, line 20 for an example where this doesn't seem to have been done). Also the formatting that has generally be used in the past is to have the subclause title, then on a newline the editing instruction in bold italic, then the change text. It would also be helpful to provide more context for some of the editing instructions such as which paragraph of a subclause is being modified. Taking the Clause 30 change as an example (of course I can't provide bold, italic or underline font so I'll use HTML markup) the text would read, with some additions to the editing instructions: <B>30.5.1.1.2 aMAUType</B> <B><I>Insert the following new entry into 'APPROPRIATE SYNTAX' between the existing 10GBASE-LR and 10GBASE-LR entries:</I></B> 10GBASE-LRM R fibre over 1310nm optics as specified in Clause 68 Note that the insert instruction is really for where stand alone text is added, underscore and strikeout makings are not used in these case, only with the change instruction. I therefore believe in a number of places where insert is used, the change instruction would actually be correct. As an example I would suggest the subclause 44.1.4.4 changes, lines 30 through 41 on page 7, should read: <B>44.1.4.4 Physical Layer signaling systems</B> <B><I>Change the 3rd paragraph of this subclause as follows:</B></I> The term 10GBASE-R, specified in Clauses 49, 51, and 52, refers to a specific family of physical layer implementations based upon 64B/66B data coding method. The 10GBASE-R family of physical layer implementations is composed of 10GBASE-SR, 10GBASE-LR, and 10GBASE-ER<U> and 10GBASE-LRM</U>. <B><I>Change the 7th paragraph of this subclause as follows:</B></I> Specifications of <S>each</S> <U>these</U> physical layer devices are contained in Clause 52 through Clause 54 <S>inclusive</S><U>and Clause 68</U>.

Suggested Remedy

See comment.

Response *Response Status* **O**

Cl **00** *SC* *P* *L* # **6**

George, John

Comment Type **TR** *Comment Status* **X**

The parameters in clause 68 create a specification that will enable compliant transceivers to support a certain percentage of single installed multimode fibers - known as fiber coverage. In past IEEE optical PMDs where coverage was relaxed to less than 100% (99%) the coverage was calculated for bi-directional links. 10GBASE-LRM requires two fibers on which to operate a bi-directional link and the end user is concerned with link coverage. For example, if the 95% fiber coverage being proposed is adopted it will result in a dangerously low 90% link coverage which is unacceptable for a PMD that will be used primarily in backbone applications.

Suggested Remedy

SuggestedRemedy: For all modeling and affected parameters in clause 68, adjust values to assure an agreed upon bi-directional link coverage. For example, to achieve 95% link coverage requires 97.5% fiber coverage (0.975^2=0.95), and 99% link coverage requires 99.5% fiber coverage.

Response *Response Status* **O**

Cl **00** *SC* *P* *L* # **7**

Law, David 3Com

Comment Type **E** *Comment Status* **X**

When self referencing please replace IEEE Std 802.3aq 200X with IEEE Std 802.3aq-200X (add the '-' between the aq and the 200X).

Suggested Remedy

See comment.

Response *Response Status* **O**

Cl **00** *SC* *P* **12** *L* **15** # **8**

Parsons, Glenn

Comment Type **E** *Comment Status* **X**

There is no need for this bolded title to introduce the new section.

Suggested Remedy

Remove text from this page or delete page

Response *Response Status* **O**

Cl **00** *SC* *P* **2** *L* **12** # **9**

James, David JGG

Comment Type **E** *Comment Status* **X**

Title is too long.

Suggested Remedy

Use a shorter summary.

Response *Response Status* **O**

Cl **00** *SC* *P* **2** *L* **37** # **10**

James, David JGG

Comment Type **E** *Comment Status* **X**

Need space between number and title.

Suggested Remedy

Use good FrameMaker templates, available at:
http://grouper.ieee.org/groups/msc/WordProcessors.html

Response *Response Status* **O**

Cl **00** *SC* *P* **2** *L* **54** # **11**

James, David JGG

Comment Type **E** *Comment Status* **X**

Title is too long and overflows the table of contents.

Suggested Remedy

Clause 68, physical ... ==> Clause 68

Response *Response Status* **O**

Cl **00** *SC* *P* **3** *L* **6** # **12**

James, David JGG

Comment Type **E** *Comment Status* **X**

Title is too long and overflows the table of contents.

Suggested Remedy

Clause 68, physical ... ==> Clause 68

Response *Response Status* **O**

Cl **00** *SC* *P* **4** *L* **1** # **13**

Grow, Robert Intel

Comment Type **E** *Comment Status* **X**

The style for the changed clauses is cumbersome and can be improved, both for readability and for closer resemblance to how the document will be published.

Suggested Remedy

Insert an additional title page as the first page of the standard (as found in IEEE Std 802.3ah-2002, appropriately edited for a draft). Include the appropriate Editorial Note on this page (the one about Change, Insert, Delete, and Replace).
Delete lines 1-16 on pages 4, 5, 6, 7, 9 and 11
Editor's choice whether to begin each changed clause on a new page, but I recommend not.

Response *Response Status* **O**

Cl **01** *SC* *P* **4** *L* **1** # **14**

Booth, Brad Intel

Comment Type **ER** *Comment Status* **X**

Both in the editor's note and the heading it should be noted that this is a change to 802.3REVam. Once REVam is complete, then you can state that it applies to 802.3-2005.

Suggested Remedy

As per comment. Also applies to Clause 30, Annex 30B, Clause 44, Clause 45 and Clause 49.

Response *Response Status* **O**

Cl **01** *SC* *P* **4** *L* **26** # **15**

Dallesasse, John Emcore Corporation

Comment Type **E** *Comment Status* **X**

Missing period at end of ITU-T reference.

Suggested Remedy

Add period.

Response *Response Status* **O**

Cl **01** *SC* **1.3** *P* **4** *L* **19** # **16**

Grow, Robert Intel

Comment Type **E** *Comment Status* **X**

Insert subclause title

Suggested Remedy

Insert: 1.3 Normative References

Response *Response Status* **O**

Cl **01** *SC* **1.3** *P* **4** *L* **20** # **17**

Booth, Brad Intel

Comment Type **E** *Comment Status* **X**

Subclause title should be entered, then editing instruction should follow.

Suggested Remedy

Change editing instruction to read: 1.3 Normative references (italics)Insert the following entries:

Response *Response Status* **O**

Cl **01** *SC* **1.3** *P* **4** *L* **20** # **18**

Grow, Robert Intel

Comment Type **E** *Comment Status* **X**

Insufficient editing instruction, the insertion is alphabetical.

Suggested Remedy

Recommend it read: ""Insert the following references into 1.3 in alphabetic order:""

Response *Response Status* **O**

Cl **01** *SC* **1.3** *P* **4** *L* **21** # **19**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Add reference(s) for encircled flux. For info, ANSI/TIA/EIA-455-203-2001; Launched Power Distribution Measurement Procedure for Graded-Index Multimode Transmitters, is already in the list of references.

Suggested Remedy

Add entry for IEC 61280-1-4. Title is Fibre optic communication subsystem test procedures - Part 1-4: General communication subsystems - Collection and reduction of two-dimensional nearfield data for multimode fibre laser transmitters Publication date: 2003-01-23

Response *Response Status* **O**

Cl **01** *SC* **1.3** *P* **4** *L* **27** # **20**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

I expect we will need a reference for IEC 60793-2-10.

Suggested Remedy

In usual format: IEC 60793-2-10 Optical fibres - Part 2-10: Product specifications - Sectional specification for category A1 multimode fibres Publication date 2004-11-04.

Response *Response Status* **O**

Cl **01** *SC* **1.4** *P* **4** *L* # **21**

Arthur, Marris Cadence

Comment Type **T** *Comment Status* **X**

Please add a definition for dBm, the unit of power measurement

Suggested Remedy

Please add a definition for dBm, the unit of power measurement

Response *Response Status* **O**

Cl **01** *SC* **1.4** *P* **4** *L* **28** # **22**

Booth, Brad Intel

Comment Type **TR** *Comment Status* **X**

Need to insert a definition for 10GBASE-LRM.

Suggested Remedy

Insert the following: 1.4 Definitions (italics)Insert the following: 1.4.xxx (bold)10GBASE-LRM:(unbold) IEEE 802.3 Physical Layer specification for 10 Gb/s using 10GBASE-T encoding and 10GBASE-L optics for multimode fiber. (See IEEE 802.3 Clause 68.)

Response *Response Status* **O**

Cl **01** *SC* **1.4** *P* **4** *L* **30** # **23**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

What's encircled flux? I couldn't find a definition either in P802.3am or P802.3aq

Suggested Remedy

Add a definition for encircled flux.

Response *Response Status* **O**

Cl **30** *SC* *P* *L* # **24**

Grow, Robert Intel

Comment Type **E** *Comment Status* **X**

To aid the publication editor and reduce the problems of parallel projects modifying the same portions of the standard add an Editor's Note.

Suggested Remedy

Insert an ""Editor's Note (to be removed prior to final publication). The publication editor might want to change some of the editing instructions for this clause to be ""Change"" instructions rather than ""Insert"". Reviewers and the publication editor should note that editing instructions have been written to minimize the probability of changes being lost at publication. Other active amendment projects (e.g., P802.3an and P802.3ap) are likely to modify the same text, and the order of approval for the active amendments is uncertain.

Response *Response Status* **O**

Cl **30** *SC* *P* **22** *L* **5** # **25**

James, David JGG

Comment Type **E** *Comment Status* **X**

Title is too long and overflows the line.

Suggested Remedy

Either: 1) Reduce the title length. 2) Break the line at a convenient location.

Response *Response Status* **O**

Cl **30** *SC* *P* **3** *L* **33** # **26**

Grow, Robert Intel

Comment Type **E** *Comment Status* **X**

Mixed title and editing instruction. Split subclause title and editing instruction.

Suggested Remedy

30.5.1.1.2 aMAUType Insert a new entry into the list of enumerations following the 10GBASE-LR entry:

Response *Response Status* **O**

Cl **30** *SC* *P* **5** *L* **20** # **27**

Law, David 3Com

Comment Type **E** *Comment Status* **X**

The title of Clause 30 was updated by IEEE Std 802.3ah-2004. Please use this updated title.

Suggested Remedy

Suggest that '30. Mb/s, 100 Mb/s, 1000 Mb/s, MAC Control, and Link Aggregation Management' be changed to read '30. Management'.

Response *Response Status* **O**

Cl **30** *SC* *P* **5** *L* **22** # **28**

James, David JGG

Comment Type **E** *Comment Status* **X**

I don't think this is a 30 Mb/s link.

Suggested Remedy

30. Mb/s ==> 30. 10 Mb/s

Response *Response Status* **O**

Cl **30** *SC* **30** *P* **5** *L* **20** # **29**
Booth, Brad Intel

Comment Type **ER** *Comment Status* **X**
Title has been changed.

Suggested Remedy
Title should read: 30. Management

Response *Response Status* **O**

Cl **30** *SC* **30** *P* **5** *L* **20** # **30**
Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**
Clause title is out of date

Suggested Remedy
Change title to 'Management'

Response *Response Status* **O**

Cl **30** *SC* **30** *P* **6** *L* **20** # **31**
Grow, Robert Intel

Comment Type **ER** *Comment Status* **X**
REVam has a different title for clause 30.

Suggested Remedy
Change simply to ""Management""

Response *Response Status* **O**

Cl **30** *SC* **30.5.1.1.2** *P* **5** *L* **23** # **32**
Booth, Brad Intel

Comment Type **E** *Comment Status* **X**
Subclause title should be entered, then editing instruction should follow. I'd also recommend that the entry be put after SR so that numbering in 30B is sequential.

Suggested Remedy
Change to read: 30.5.1.1.2 aMAUType (italics)Insert a new entry into the list following the 10GBASE-SR entry:

Response *Response Status* **O**

Cl **30B** *SC* *P* **6** *L* **1** # **33**
Grow, Robert Intel

Comment Type **E** *Comment Status* **X**
I think the proper order is changed clauses, changed annexes, then new clauses.

Suggested Remedy
Move to be last changed section.

Response *Response Status* **O**

Cl **30B** *SC* **30.2** *P* **6** *L* **25** # **34**
Law, David 3Com

Comment Type **T** *Comment Status* **X**
Syntax error, missing coma after the close brackets (or parenthesis if you prefer).

Suggested Remedy
Change the text: 10GBASE-LRM(494) --R fibre over 1310nm optics as specified in Clause 68 to read: 10GBASE-LRM(494), --R fibre over 1310nm optics as specified in Clause 68

Response *Response Status* **O**

Cl **30B** *SC* **30B.2** *P* **6** *L* **18** # **35**
Grow, Robert Intel

Comment Type **E** *Comment Status* **X**
Split the titles and uses appropriate level style.

Suggested Remedy
Annex 30B 30B.2 ASN.1 module for CSMA/CD managed objects

Response *Response Status* **O**

Cl **30B** *SC* **30B.2** *P* **6** *L* **18** # **36**
Booth, Brad Intel

Comment Type **ER** *Comment Status* **X**
Annex title and subclause headings are merged.

Suggested Remedy
Change to be what is in .3REVam.

Response *Response Status* **O**

Cl **30B** *SC* **30B.2** *P* **6** *L* **26** # **37**

Booth, Brad Intel

Comment Type **ER** *Comment Status* **X**

Numbering is out of order.

Suggested Remedy

Place 10GBASE-LRM after 10GBASE-SR.

Response *Response Status* **O**

Cl **30B** *SC* **30B2** *P* **6** *L* **22** # **38**

Grow, Robert Intel

Comment Type **E** *Comment Status* **X**

Inconsistent style for the inserts, surrounding context is not required to understand.

Suggested Remedy

Delete all lines except for the new 10GBASE-LRM line.

Response *Response Status* **O**

Cl **44** *SC* *P* **7** *L* # **39**

Grow, Robert Intel

Comment Type **E** *Comment Status* **X**

The subclause and instructions should be split in all cases.

Suggested Remedy

Split and put the subclause with title on its own line, and one or more instructions with modified text following that subclause title.

Response *Response Status* **O**

Cl **44** *SC* **44.1.1** *P* **7** *L* **20** # **40**

Booth, Brad Intel

Comment Type **ER** *Comment Status* **X**

Subclause title should be entered, then editing instruction should follow. This applies to Clauses 44, 45 and 49.

Suggested Remedy

Use the .3REVam subclause headings. Insert the editing instructions after the subclause headings all in bold italic text.

Response *Response Status* **O**

Cl **44** *SC* **44.1.3** *P* **7** *L* **26** # **41**

Dallesasse, John Emcore Corporation

Comment Type **E** *Comment Status* **X**

""l"" in ""10GBASE-lRM"" in the text that describes the editorial change should be capitalized.

Suggested Remedy

Change ""l"" to ""L""

Response *Response Status* **O**

Cl **44** *SC* **44.1.3** *P* **7** *L* **28** # **42**

Booth, Brad Intel

Comment Type **E** *Comment Status* **X**

Put in the complete bullet d).

Suggested Remedy

As per comment.

Response *Response Status* **O**

Cl **44** *SC* **44.1.4** *P* **7** *L* **35** # **43**

Law, David 3Com

Comment Type **E** *Comment Status* **X**

Typo, redundant 'and'.

Suggested Remedy

'.. LR, and 10GBASE-ER and 10GBASE-LRM.' shoudl read '.. LR, 10GBASE-ER and 10GBASE-LRM.'

Response *Response Status* **O**

Cl **44** *SC* **44.1.4.4** *P* **7** *L* **30** # **44**

Grow, Robert Intel

Comment Type **E** *Comment Status* **X**

Hard to find the insert, identify paragraph.

Suggested Remedy

Change instruciton to read: Insert 10GBASE-LRM into family of 10GBASE-R physical layer implementations in the third paragraph, as follows:

Response *Response Status* **O**

Cl **44** *SC* **44.1.4.4** *P* **7** *L* **33** # **45**

Thaler, Pat — Agilent Technologies

Comment Type **E** *Comment Status* **X**

Since Clause 52 is included, ""Clause 68"" should be added to the list of clauses that define 10GBASE-R.

Suggested Remedy

Response *Response Status* **O**

Cl **44** *SC* **44.1.4.4** *P* **7** *L* **33** # **46**

Booth, Brad — Intel

Comment Type **ER** *Comment Status* **X**

Missing Clause 68 in the list of 10GBASE-R clauses.

Suggested Remedy

Change the text to read: The term 10GBASE-R, specified in Clauses 49, 51, 52 and 68, refers to...

Response *Response Status* **O**

Cl **44** *SC* **44.1.4.4** *P* **7** *L* **35** # **47**

Grow, Robert — Intel

Comment Type **E** *Comment Status* **X**

Missing strikethrough.

Suggested Remedy

Strikethrough ""and""

Response *Response Status* **O**

Cl **44** *SC* **44.1.4.4** *P* **7** *L* **35** # **48**

Bradshaw, Peter — Intersil

Comment Type **E** *Comment Status* **X**

The repeated 'and' in the ammended line is not desirable.

Suggested Remedy

Either:- 1. change the insertion to "", 10GBASE-LRM"" and place it after ""10GBASE-LR"" or 2. remove the ""and "" after ""10GBASE-ER""

Response *Response Status* **O**

Cl **44** *SC* **44.1.4.4** *P* **7** *L* **35** # **49**

Jaeger, John — Big Bear Networks

Comment Type **E** *Comment Status* **X**

There is an extra 'and' in the 2nd sentence of the statement to be inserted into 44.1.4.4

Suggested Remedy

Delete the first 'and' and have the 2nd sentence read: The 10GBASE-R family of physical layer implementations is composed of 10GBASE-SR, 10GBASE-LR, 10GBASE-ER and 10GBASE-LRM.

Response *Response Status* **O**

Cl **44** *SC* **44.1.4.4** *P* **7** *L* **35** # **50**

Booth, Brad — Intel

Comment Type **E** *Comment Status* **X**

Extra and not required.

Suggested Remedy

Change end of sentence to read: ... is composed of 10GBASE-SR, 10GBASE-LR, 10GBASE-ER, and 10GBASE-LRM.

Response *Response Status* **O**

Cl **44** *SC* **44.1.4.4** *P* **7** *L* **37** # **51**

Grow, Robert — Intel

Comment Type **E** *Comment Status* **X**

Hard to find the edit.

Suggested Remedy

Add ""last paragraph"" to the editing instruction.

Response *Response Status* **O**

Cl **44** *SC* **44.1.4.4** *P* **7** *L* **39** # **52**

Booth, Brad Intel

Comment Type **ER** *Comment Status* **X**

This sentence was changed pretty dramatically and one of the edits is not shown. Return the sentence to its original state and add Clause 68.

Suggested Remedy

Change to read: Specifications of each physical layer device are contained in Clauses 52, 53, 54 and 68.

Response *Response Status* **O**

Cl **44** *SC* **44.1.4.4** *P* **7** *L* **39** # **53**

Bradshaw, Peter Intersil

Comment Type **E** *Comment Status* **X**

The change is incorrectly marked. The ""s"" at the end of ""devices"" is an addition.

Suggested Remedy

Underline the ""s"" in ""devices""

Response *Response Status* **O**

Cl **44** *SC* **44.1.4.4** *P* **7** *L* **42** # **54**

Grow, Robert Intel

Comment Type **E** *Comment Status* **X**

Misleading editorial instruction.

Suggested Remedy

Insert the column for Clause 68 and the row for 10GBASE-LRM into Table 44–1, as shown below:

Response *Response Status* **O**

Cl **44** *SC* **44.1.4.4** *P* **7** *L* **48** # **55**

Bradshaw, Peter Intersil

Comment Type **ER** *Comment Status* **X**

The addition to Table 44-2 would seem to need an ""or"" rather than an ""and"" here. The two references are, as far as I can see, identical except for subclause number. The instruction to ""see"" either of them seems unnecessary, since, apart from repeating part of the material of this subclause, the main effect of both 52.2 and 68.2 is to refer the reader BACK to 44.3. Which is where Table 44-2 appears, NOT in 44.1.4.4 as it is now listed.

Suggested Remedy

First, insert the CORRECT subclause number before this entry: the Table to be altered is in subclause 44.3, NOT 44.1.4.4. Second: either delete the "" See 52.2"" altogether, or change ""or"" to ""and"". The former is prefereable, since this near-useless reference, if extended, will probably cause a line wrap in the table, probably forcing more of the next table onto the next page.... Too much for such a near-circular reference.

Response *Response Status* **O**

Cl **44** *SC* **44.1.4.4** *P* **8** *L* **10** # **56**

James, David JGG

Comment Type **E** *Comment Status* **X**

The blank cells are confusing. Sometimes these are used to represent straddled cells, or TBDs, which are not (I believe) the intent.

Suggested Remedy

Fill each blank cell with an em dash.

Response *Response Status* **O**

Cl **44** *SC* **44.1.44** *P* **7** *L* **35** # **57**

Arthur, Marris Cadence

Comment Type **E** *Comment Status* **X**

Delete "",and""

Suggested Remedy

Delete "",and""

Response *Response Status* **O**

Cl **44** *SC* **44.4** *P* **8** *L* **13** # **58**

Bradshaw, Peter Intersil

Comment Type **ER** *Comment Status* **X**

The Table 44-1 incorporated in the draft is not that of the current RevAM draft. In particular, it does NOT include the line referring to 10GBASE-CX4

Suggested Remedy

Add the new line for 10GBASE-LRM to the CORRECT table.

Response *Response Status* **O**

Cl **44** *SC* **44.5** *P* **8** *L* **21** # **59**

Grow, Robert Intel

Comment Type **E** *Comment Status* **X**

Missing subclause title

Suggested Remedy

Add ""44.5 Relation of 10 Gigabit Ethernet to other standards""

Response *Response Status* **O**

Cl **44** *SC* **44.5** *P* **8** *L* **22** # **60**

Grow, Robert Intel

Comment Type **E** *Comment Status* **X**

This can be a change instruction, 802.3an is not modifying this table.

Suggested Remedy

Change Table 44–4, as follows:

Response *Response Status* **O**

Cl **44** *SC* **Table 44-1** *P* **8** *L* # **61**

Grow, Robert Intel

Comment Type **TR** *Comment Status* **X**

Wrong table source. This does not include changes of IEEE Std 802.3ak.

Suggested Remedy

Use table from 802.3REVam. It would improve readability to unfloat the table.

Response *Response Status* **O**

Cl **44** *SC* **Table 44-1** *P* **8** *L* **1** # **62**

Booth, Brad Intel

Comment Type **ER** *Comment Status* **X**

There is no editing instruction for the insertion of LRM into Table 44-1.

Suggested Remedy

Add editing instruction.

Response *Response Status* **O**

Cl **44** *SC* **Table 44-1** *P* **8** *L* **7** # **63**

Law, David 3Com

Comment Type **T** *Comment Status* **X**

The headings for both the clause 52 1310 nm and clause 68 1310 nm columns both read '1310 nm Serial PMD'. Since this is the overview to 10Gb/s operation clause can we try and put something here to guide the reader.

Suggested Remedy

Modify the colum headings to provide differetiation between Clause 52 and 68 1310 nm PMD.

Response *Response Status* **O**

Cl **44** *SC* **Table 44-2** *P* **7** *L* **45** # **64**

Booth, Brad Intel

Comment Type **ER** *Comment Status* **X**

Table numbering is incorrect. Table should also be provided as a reference.

Suggested Remedy

Change edit instruction to point to Table 44-2, not Table-44.2. Add Table 44-2 and show the edit in the table.

Response *Response Status* **O**

Cl **45** SC P **9** L **20** # **65**

Grow, Robert Intel

Comment Type **E** *Comment Status* **X**

The subclause and instructions should be split in all cases.

Suggested Remedy

Split and put the subclause with title on its own line, and one or more instructions with modified text following that subclause title.

Response *Response Status* **O**

Cl **45** SC **45.2.1.8** P **10** L **8** # **66**

Cravens, George

Comment Type **E** *Comment Status* **X**

Bit(s) entry reads 1.11.15:3 , there is no bit 2.

Suggested Remedy

Response *Response Status* **W**

Change Bit(s) entry to 1.11.15:2.

Cl **45** SC **45** P **9** L **17** # **67**

Grow, Robert Intel

Comment Type **ER** *Comment Status* **X**

Incorrect title, differs from REVam.

Suggested Remedy

45. Management Data Input/Output (MDIO) Interface

Response *Response Status* **O**

Cl **45** SC **45** P **9** L **18** # **68**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Clause title is wrong

Suggested Remedy

Change to: Management Data Input/Output (MDIO) Interface

Response *Response Status* **O**

Cl **45** SC **45.2.1.10** P **10** L **1** # **69**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Unwanted italics?

Suggested Remedy

Put ':' in upright font.

Response *Response Status* **O**

Cl **45** SC **45.2.1.10** P **10** L **1** # **70**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Table 45-11 lacks a subclause heading.

Suggested Remedy

Insert '45.2.1.10 10G PMA/PMD extended ability register (Register 1.11)'. Put the reference to table 45-11 (currently '45-12') in this subclause.

Response *Response Status* **O**

Cl **45** SC **45.2.1.10** P **10** L **1** # **71**

Grow, Robert Intel

Comment Type **ER** *Comment Status* **X**

Missing subclause number/title. Improve editing instruction

Suggested Remedy

45.2.1.10 10G PMA/PMD extended ability register (Register 1.11) Insert row into Table 45-11 to define reserved bit 1.11.1 for 10GBASE_LRM, as follows: Editor's Note (to be removed prior to publication): Other projects are defining bits in this register (e.g., P802.3an and P802.3ap). Depending on order of publication, the number of rows in the table my need to be adjusted at time of publication. Bit 1.11.2 is proposed for use by 10GBASE-T, bits 1.11.3, and bits 1.11.4 are proposed for use by 10GBASE-KR4 and 10GBASE-KR respectively. Reserved bits will also need to be adjusted based on order of publication.

Response *Response Status* **O**

Cl **45** *SC* **45.2.1.10** *P* **10** *L* **1** # **72**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Wrong table number

Suggested Remedy

Change 'Table 45-12' to 'Table 45-11'.

Response *Response Status* **O**

Cl **45** *SC* **45.2.1.10** *P* **10** *L* **8** # **73**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Table omits bit 1.11.15.2.

Suggested Remedy

Change '1.11.15:3' to '1.11.15:2'. (Leave 10GBASE-T to declare 1.11.15:2)

Response *Response Status* **O**

Cl **45** *SC* **45.2.1.6** *P* *L* # **74**

Bradshaw, Peter Intersil

Comment Type **E** *Comment Status* **X**

Table 45-7. Although my attempts to ""rationalize"" the assignemnts in this table during the CX4 task force were resoundingly rejected, it wouls still seem more rational to use '1000' for 10GBASE-T (closer to '0000' for the other electrical cable standard, CX4) and '1001' for 10GBASE-LRM

Suggested Remedy

Swap the two lines for 10GBASE-T and 10GBASE-LRM. Obviously, this would need to be co-ordinated with the 10GBASE-T task force.

Response *Response Status* **O**

Cl **45** *SC* **45.2.1.6** *P* **9** *L* **33** # **75**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Table 45-7 lacks a subclause heading.

Suggested Remedy

Insert (in numerical order): '45.2.1.6 10G PMA/PMD control 2 register (Register 1.7)'. Put the reference to table 45-7 in this subclause.

Response *Response Status* **O**

Cl **45** *SC* **45.2.1.6** *P* **9** *L* **34** # **76**

Booth, Brad Intel

Comment Type **ER** *Comment Status* **X**

Table 45-7 is incorrectly numbered and should be located under the correct subclause heading.

Suggested Remedy

Insert subclause heading for 45.2.1.6 and then place the editing instructions for the table in that subclause. More importantly, change the table to be Table 45-8.

Response *Response Status* **O**

Cl **45** *SC* **45.2.1.6** *P* **9** *L* **34** # **77**

Grow, Robert Intel

Comment Type **TR** *Comment Status* **X**

Missing subclause title, change instruction needs to be improved

Suggested Remedy

45.2.1.6 10G PMA/PMD control 2 register (Register 1.7) Change the Table 45-7 as follows:

Editor's Note (to be removed prior to publication): Table 45-7 is also being modified by P802.3an and P802.3ap. If P802.3an is not published prior to or simultaneous with P802.3aq, the line for bits 1.7.3:0 value 1001 should be ""Reserved"". If P802.3ap is not published prior to or simultaneous with P802.3aq bits 1.7.3:0 values 1011 and 1010 should be ""Reserved"". Other change markings are against P802.3REVam, and may need to be modified based on publication order of current amendment projects, with edit reference changed to latest amendment.

Define bits 1.7.3:0 values for 802.3ap (with underline)
1 0 1 1 = 10GBASE-KR PMA/PMD type
1 0 1 0 = 10GBASE-KX4 PMA/PMD type

Response *Response Status* **O**

Cl **45** *SC* **45.2.1.6** *P* **9** *L* **45** # **78**

Claseman, George Micrel

Comment Type **E** *Comment Status* **X**

n table 45-7, code point 1001 indicates 10GBASE-T PMA/PMD type. No such standard exists yet.

Suggested Remedy

Change to ""Reserved"".

Response *Response Status* **O**

Cl **45** *SC* **45.2.1.6** *P* **9** *L* **46** # **79**

Grow, Robert Intel

Comment Type **ER** *Comment Status* **X**

Incomplete change

Suggested Remedy

Change to read ""10GBASE-LRM PMA/PMD type

Response *Response Status* **O**

Cl **45** *SC* **45.2.1.7.4** *P* **7** *L* **22** # **80**

Booth, Brad Intel

Comment Type **ER** *Comment Status* **X**

The changes shown are hard to understand considering none of the relevant data in included. This also applies to 45.1.7.5 and 45.2.1.8.

Suggested Remedy

Insert the full paragraph showing the change made to the paragraph.

Response *Response Status* **O**

Cl **45** *SC* **45.2.1.7.4** *P* **9** *L* **18** # **81**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Unwanted period after 'fault'

Suggested Remedy

Remove. Also in 45.2.1.7.5, and at end of line that starts 'Table 45-7'.

Response *Response Status* **O**

Cl **45** *SC* **45.2.1.7.4** *P* **9** *L* **22** # **82**

Bradshaw, Peter Intersil

Comment Type **ER** *Comment Status* **X**

Although the texts of 52.4.8 and 68.4.8 appear close to identical, it would seem more user-friendly to give the user soem quide as to what is ""appropriate"".

Suggested Remedy

Instead of the addition at the end of the sentence, use the following: ""The description of the transmit fault function for 10GBASE-LRM serial PMDs is given in 68.4.8, and for other serial PMDs in 52.4.8.""

Response *Response Status* **O**

Cl **45** *SC* **45.2.1.7.5** *P* **9** *L* **26** # **83**

Bradshaw, Peter Intersil

Comment Type **ER** *Comment Status* **X**

Although the texts of 52.4.9 and 68.4.9 appear close to identical, it would seem more user-friendly to give the user soem quide as to what is ""appropriate"".

Suggested Remedy

Instead of the addition at the end of the sentence, use the following: ""The description of the receive fault function for 10GBASE-LRM serial PMDs is given in 68.4.9, and for other serial PMDs in 52.4.9.""

Response *Response Status* **O**

Cl **45** *SC* **45.2.1.7.5** *P* **9** *L* **26** # **84**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Unwanted word

Suggested Remedy

Remove 'Clause'.

Response *Response Status* **O**

Cl **45** SC **45.2.1.7.8** P **9** L **31** # **85**

Bradshaw, Peter Intersil

Comment Type **ER** *Comment Status* **X**

Although the texts of 52.4.7 and 68.4.7 appear close to identical, it would seem more user-friendly to give the user soem quide as to what is ""appropriate"".

Suggested Remedy

Instead of the addition at the end of the sentence, use the following: ""The transmit disable function for 10GBASE-LRM serial PMDs is described in 68.4.7, and for other serial PMDs in 52.4.7.""

Response *Response Status* **O**

Cl **45** SC **45.2.1.8** P **10** L **11** # **86**

James, David JGG

Comment Type **E** *Comment Status* **X**

Listings of values normally start from 0.

Suggested Remedy

Switch the 0-value and 1-value description.

Response *Response Status* **O**

Cl **45** SC **45.2.1.8** P **10** L **16** # **87**

James, David JGG

Comment Type **E** *Comment Status* **X**

Misleading capitalization

Suggested Remedy

Read Only

Response *Response Status* **O**

Cl **45** SC **45.2.1.8** P **9** L **40** # **88**

James, David JGG

Comment Type **T** *Comment Status* **X**

The cell entries and the footnote should both be RW, so as to not be confused with the header.

Suggested Remedy

Change cell entries and footnote: R/W ==> RW, here and througout

Response *Response Status* **O**

Cl **45** SC **45.2.1.8** P **9** L **55** # **89**

James, David JGG

Comment Type **E** *Comment Status* **X**

Misleading capitalization

Suggested Remedy

Read/Write ==> read/write

Response *Response Status* **O**

Cl **45** SC **Table 45-11** P **10** L # **90**

Law, David 3Com

Comment Type **T** *Comment Status* **X**

Suggest text be added to describe the new LRM ability bit similar to that that already exists for 10GBASE-LRM in (IEEE P802.3REVam) subclause 45.2.1.7.9 '10GBASE-LR ability (1.8.6)'.

Suggested Remedy

Suggest the following new subclause be added: 45.X.X.X.X 10GBASE-LRM ability (1.11.1) When read as a one, bit 1.11.1 indicates that the PMA/PMD is able to support a 10GBASE-LRM PMA/PMD type. When read as a zero, bit 1.11.1 indicates that the PMA/PMD is not able to support a 10GBASE-LRM PMA/PMD type.

Response *Response Status* **O**

Cl **45** SC **Table 45-11** P **10** L **8** # **91**

Law, David 3Com

Comment Type **T** *Comment Status* **X**

There are only two used bit so far in this register so shouldn't the reserved bits span 15:2.

Suggested Remedy

Change the text '1.11.15:3' to read '1.11.15:2'.

Response *Response Status* **O**

Cl **45** *SC* **Table 45-12** *P* **10** *L* **4** # **92**

Booth, Brad Intel

Comment Type **E** *Comment Status* **X**

Table heading incorrect.

Suggested Remedy

Change to be Table 45-12.

Response *Response Status* **O**

Cl **45** *SC* **Table 45-12** *P* **10** *L* **8** # **93**

Booth, Brad Intel

Comment Type **E** *Comment Status* **X**

Bit numbering is incorrect.

Suggested Remedy

Change 1.11.15:3 to be 1.11.15:2.

Response *Response Status* **O**

Cl **45** *SC* **Table 45-7** *P* **9** *L* # **94**

Law, David 3Com

Comment Type **T** *Comment Status* **X**

I believe the text in (IEEE P802.3REVam) subclause 45.2.1.6.1 'PMA/PMD type selection (1.7.2:0)' needs to be updated to reflect the use of 4 bits rather than three in the 10G PMA/PMD control 2 register as well as the extension to the 10G PMA/PMD Extended Ability register.

Suggested Remedy

Suggest subclause 45.2.1.6.1 be changed to read: 45.2.1.6.1 PMA/PMD type selection (1.7.3:0) The PMA/PMD type of the 10G PMA/PMD shall be selected using bits 3 through 0. The PMA/PMD type abilities of the 10G PMA/PMD are advertised in bits 9 and 7 through 0 of the 10G PMA/PMD status 2 register and bit 0 and 1 of the 10G PMA/PMD extended ability register. A 10G PMA/PMD shall ignore writes to the PMA/PMD type selection bits that select PMA/PMD types it has not advertised in the status register. It is the responsibility of the STA entity to ensure that mutually acceptable MMD types are applied consistently across all the MMDs on a particular PHY. The PMA/PMD type selection defaults to a supported ability.

Response *Response Status* **O**

Cl **45** *SC* **Table 45-7** *P* **9** *L* **45** # **95**

Law, David 3Com

Comment Type **E** *Comment Status* **X**

Why is the text PMA/PMD not added so that the 10GBASE-LRM entry is the same as all other entries.

Suggested Remedy

Change the text '10GBASE-LRM' to read '10GBASE-LRM PMA/PMD type'.

Response *Response Status* **O**

Cl **45** *SC* **Table 45-7** *P* **9** *L* **45** # **96**

Law, David 3Com

Comment Type **E** *Comment Status* **X**

The 10GBASE-T PMA/PMD appears here as existing text however in Table 45-11 on the next page there is no mention of the 10GBASE-T PMA/PMD.

Suggested Remedy

Either show the 10GBASE-T related bits as existing text or not, would seem a good idea to not as IEEE P802.3aq is expected to be approved prior to IEEE P802.3an.

Response *Response Status* **O**

Cl **49** *SC* **49** *P* **11** *L* **19** # **97**

Grow, Robert Intel

Comment Type **E** *Comment Status* **X**

All of these modifications can and should be written as Changes. 10GBASE-KR will not be modifying clause 49, any exceptions will be covered in clause 69.

Suggested Remedy

Rewrite each modification as a Change.

Response *Response Status* **O**

Cl **49** *SC* **49** *P* **11** *L* **19** # **98**

Grow, Robert Intel

Comment Type **ER** *Comment Status* **X**

The subclause and instructions should be split in all cases.

Suggested Remedy

Split and put the subclause with title on its own line, and one or more instructions with modified text following that subclause title.

Response *Response Status* **O**

Cl **49** *SC* **49.1.2** *P* **11** *L* **20** # **99**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Grammar?

Suggested Remedy

Change 'item d in to the list' to 'item d of the list'.

Response *Response Status* **O**

Cl **49** *SC* **49.1.2** *P* **11** *L* **22** # **100**

Booth, Brad Intel

Comment Type **E** *Comment Status* **X**

Show the bullet d).

Suggested Remedy

As per comment.

Response *Response Status* **O**

Cl **49** *SC* **49.11** *P* **11** *L* # **101**

Law, David 3Com

Comment Type **E** *Comment Status* **X**

Shouldn't 10GBASE-LRM be added to the list of PHYs in the scope subclause for Clause 49, type 10GBASE-R.

Suggested Remedy

See comment.

Response *Response Status* **O**

Cl **49** *SC* **Figure 49-1** *P* **11** *L* # **102**

Law, David 3Com

Comment Type **T** *Comment Status* **X**

Shouldn't 10GBASE-LRM be added to Figure 49-1. Specifically '-LRM' should be added to the list of PMD types under the serial 'stack'. Some text should also be added to the list of media under the heading 'PMD TYPES:' in the lower right corner of the figure.

Suggested Remedy

See comment.

Response *Response Status* **O**

Cl **68** *SC* *P* **11** *L* **15** # **103**

Claseman, George Micrel

Comment Type **E** *Comment Status* **X**

Title page. This information is conveyed on the next page.

Suggested Remedy

Remove title page.

Response *Response Status* **O**

Cl **68** *SC* *P* **12** *L* # **104**

Thaler, Pat Agilent Technologies

Comment Type **ER** *Comment Status* **X**

I don't understand the purpose of this page. Do you intend it to be part of the standard? It appears to be unnecessary.

Suggested Remedy

Delete the page or if you want to start Clause 68 on an odd page, replace with the traditional ""this page intentionally left almost blank"" page.

Response *Response Status* **O**

Cl **68** *SC* *P* **12** *L* **1** # **105**

Booth, Brad Intel

Comment Type **E** *Comment Status* **X**

This page is not required.

Suggested Remedy

Delete.

Response *Response Status* **O**

Cl **68** SC P **13** L **1** # **106**

Booth, Brad Intel

Comment Type **ER** *Comment Status* **X**

Heading for this clause is missing some information and contains unnecessary information.

Suggested Remedy

Change heading to read: Physical medium dependent (PMD) sublayer and baseband medium, type 10GBASE-LRM If this comment is accepted, a change will be required to the heading of 68.10 and to the text in 68.10.1, 68.10.2.2 and 68.10.3.

Response *Response Status* **O**

Cl **68** SC P **18** L **33** # **107**

George, John

Comment Type **T** *Comment Status* **X**

In table 68-3 the term "default" launch is confusing. The intent is that this launch is the preferred launch to minimize link failures for the initial end user attempt to operate the link.

Suggested Remedy

SuggestedRemedy: Change "Default" to "Preferred"

Response *Response Status* **O**

Cl **68** SC P **19** L **2** # **108**

George, John

Comment Type **T** *Comment Status* **X**

In table 68-3 footnote e must be clarified to minimize link failures by encouraging the use of the "best" launch.

Suggested Remedy

SuggestedRemedy: In footnote e, replace the first sentence "The default launches are the preferred launches" WITH "The preferred launch must be used at each end of the link on the initial attempt to operate the link, to minimize the probability of link failure. If the link fails using the preferred launch, the alternative launch on one or both ends of the link may enable a functional link."

Response *Response Status* **O**

Cl **68** SC P **19** L **3641** # **109**

Thompson, Joey Circadiant Sysytems, I

Comment Type **T** *Comment Status* **X**

(Table 68-4) The ""informative"" simple stressed receiver test is potentially misleading and cannot be fixed because it will poorly correlate with the normative compreshensive stressed receiver test.

Suggested Remedy

remove all mention to simple stressed receiver; specifically, remove lines 36-41

Response *Response Status* **O**

Cl **68** SC P **20** L **3** # **110**

Thompson, Joey Circadiant Sysytems, I

Comment Type **T** *Comment Status* **X**

(footnotes to Figure 68-4) footnote 'c' is vague.

Suggested Remedy

use revised wording for footnote 'c': ""Noise bandwidth refers to the -3dB (electrical) point of the noise spectrum before any subsequent filtering is supplied.

Response *Response Status* **O**

Cl **68** SC P **20** L **3941** # **111**

Thompson, Joey Circadiant Sysytems, I

Comment Type **T** *Comment Status* **X**

The ""informative"" simple stressed receiver test is potentially misleading and cannot be fixed because it will poorely correlate with the normative comprehensive stressed receiver test. This test's inclusion will produce more confusion than it solves.

Suggested Remedy

Remove row entitled ""Simple stressed receiver sensitivity"".

Response *Response Status* **O**

Cl **68** *SC* *P* **20** *L* **6** # **112**

Thompson, Joey Circadiant Sysytems, I

Comment Type **T** *Comment Status* **X**

(Submitted as TR) (footnote to Figure 68-4) The ""informative"" simple stressed receiver test is potentially misleading and cannot be fixed because it will poorely correlate with the normative comprehensive stressed receiver test. This test's inclusion will produce more confusion than it solves.

Suggested Remedy

Remove footnote 'e'.

Response *Response Status* **O**

Cl **68** *SC* *P* **22** *L* **32** # **113**

Thompson, Joey Circadiant Sysytems, I

Comment Type **T** *Comment Status* **X**

The vertical and horizontal limits of the plot (Figure 68-5) are exact but the diagonal limits (in particular the ER=3.5dB) are approximate and depend upon eye shape. The values in table 68-3 define the requirement, Figure 68-5 is merely a visual aid.

Suggested Remedy

Change in the figure title: ""Region of transmitter compliance"" to ""Approximate region of transmitter compliance"".

Response *Response Status* **O**

Cl **68** *SC* *P* **28** *L* **53** # **114**

Thompson, Joey Circadiant Sysytems, I

Comment Type **T** *Comment Status* **X**

Figure 68-10 is a conceptual block diagram. The goal is to have a real-world result that approaches the concept.

Suggested Remedy

Change: ""Measurement configuration"" to ""Conceptual measurement configuration"".

Response *Response Status* **O**

Cl **68** *SC* **5** *P* **17** *L* **10** # **115**

Cobb, Terry Commscope

Comment Type **TR** *Comment Status* **X**

Table 68-2. The maximum operating range for 50 um fibers with 500/500 and 400/400 MHz-km modal bandwidths has not been substantiated.

Suggested Remedy

Use actual range limits based on necessary analysis and experiments using worst case models.

Response *Response Status* **O**

Cl **68** *SC* **6.6** *P* **23** *L* **46** # **116**

Lindsay, Tom ClariPhy Communicati

Comment Type **TR** *Comment Status* **X**

Another comment proposes changing the signal strength measurement from OMA to RF signal power where, in general, a stronger signal will improve the SNR at a slicer input. Although that proposal analyses the signal in a manner that is relevant to an EDC system, there still may be concern that the signal is highly distorted and could cause an implementation penalty cliff. Therefore, we may still need a separate cap on distortion. The current TWDP method is based on same-OMA scaling, and can incorrectly cause changes in signal strength to appear as a change in penalty.

Suggested Remedy

Some options (combinations are possible): 1. Impose non-idealities into the EDC emulator used with the TWDP code to represent real equalizers. Examples are finite EQ lengths or intentional timing error, which also presumes finite length. 2. Determine penalty via loss in SNR at the slicer input compared to a matched filter bound as determined by the signal at the channel input, including the transmitter. 3. Rely only on the Tx RF signal power metric until it is justified that an implementation penalty cliff exists.

Response *Response Status* **O**

Cl **68** *SC* **6.8** *P* **18** *L* **17** # **117**

Dudek, Mike Picolight

Comment Type **T** *Comment Status* **X**

Table 68-3 What matters to the Receiver is the signal to noise ratio of the equalized signal (plus a maximum amount of distortion to equalize). The measurement of TWDP becomes imprecise with different shaped Tx outputs due to the difficulty in defining OMA. It would be better to specify these quantities in the way that matters to the receiver and so that inaccuracies in the OMA definition cancel out. Also if parts have low TWDP there is no need to have as large an OMA or average output power.

Suggested Remedy

Change ""Launch power in OMA min"" value to ""-9.5dBm + TWDP"". Reduce Average Launch Power min to -7.5dBm.

Response *Response Status* **O**

Cl **68** *SC* **68** *P* **13** *L* **1** # **118**

Grow, Robert Intel

Comment Type **E** *Comment Status* **X**

Delete the parenthetical information from the title.

Suggested Remedy

Delete here and in other subclause titles (e.g., in the PICS).

Response *Response Status* **O**

Cl **68** *SC* **68.1** *P* **13** *L* **0** # **119**

Thompson, Geoff

Comment Type **E** *Comment Status* **X**

Figure does not have crosshatching, as promised, in the PMD portion of Figure 68-1 as far as I can tell.

Suggested Remedy

Crosshatch at the precise density previously determined by 802.3 project editors to show on both screen and printout.

Response *Response Status* **O**

Cl **68** *SC* **68.1** *P* **13** *L* **10** # **120**

Grow, Robert Intel

Comment Type **ER** *Comment Status* **X**

""other"" is not strong enough.

Suggested Remedy

Replace with ""functionally equivilent"".

Response *Response Status* **O**

Cl **68** *SC* **68.1** *P* **13** *L* **12** # **121**

Booth, Brad Intel

Comment Type **E** *Comment Status* **X**

hatched is not usually the term used.

Suggested Remedy

Change to be shaded.

Response *Response Status* **O**

Cl **68** *SC* **68.1** *P* **13** *L* **6** # **122**

Law, David 3Com

Comment Type **E** *Comment Status* **X**

Typo.

Suggested Remedy

Shouldn't '10GBASE' read '10GBASE-LRM'.

Response *Response Status* **O**

Cl **68** *SC* **68.1** *P* **13** *L* **7** # **123**

Booth, Brad Intel

Comment Type **ER** *Comment Status* **X**

Paragraph is unclear and is missing information. There is also no ""other means"" defined for management functions, so that should be deleted.

Suggested Remedy

Change to read: This clause specifies the 10GBASE-LRM PMD and the baseband medium for multimode optical fiber. In order to form a complete physical layer, the PMD is combined with the appropriate sublayers in Table 52-2 and optionally with the management functions that may be accessible through the management interface defined in Clause 45.

Response *Response Status* **O**

Cl **68** *SC* **68.1** *P* **13** *L* **7** # **124**

Grow, Robert Intel

Comment Type **E** *Comment Status* **X**

Text needs to be improved.

Suggested Remedy

This clause specifies the PMD and multimode fiber media for a serial PHY. The PMD uses the 10GBASE-R PMA of Clause 51, and the same MDI used by other 10GBASE-R PMDs as specified in Clause 52.

Response *Response Status* **O**

Cl **68** *SC* **68.1** *P* **13** *L* **7** # **125**

Dawe, Piers Agilent

Comment Type **T** *Comment Status* **X**

This sentence: 'This clause specifies the 10GBASE-LRM PMD and multimode fiber media for the 10GBASE serial LAN PHY.' says that clause 68 specifies the multimode fiber media for the 10GBASE serial LAN PHY. That's at best misleading, as clause 52 also specifies multimode fiber for the 10GBASE serial LAN PHY. Also, the PMD is not 'for' the PHY, it's _part of_ the PHY. Editorial: serial LAN PHY is 10GBASE-R not just 10GBASE.

Suggested Remedy

Change to 'This clause specifies the 10GBASE-LRM PMD of the 10GBASE-R serial LAN PHY, and associated multimode fiber media.'

Response *Response Status* **O**

Cl **68** *SC* **68.1.1** *P* **13** *L* **47** # **126**

Thaler, Pat Agilent Technologies

Comment Type **ER** *Comment Status* **X**

This subclause is unnecessary and sets a bad precedent. Our Clauses are part of a document and don't need to state that. None of the other Clauses have such a section but the definitions and such in Clause 1 apply equally to them. Because this Clause is not contiguous with the other 10 Gig clauses, a reference to that for the overview of 10 Gig is useful.

Suggested Remedy

Delete this Clause. Add to 68.1 at the end of the paragraph beginning ""Figure 68-1 depicts.... ""See Clause 44 for an introduction to 10 Gigabit Ethernet and the relationship of the 10GBASE-LRM PMD to other sublayers.""

Response *Response Status* **O**

Cl **68** *SC* **68.10** *P* **36** *L* **2** # **127**

James, David JGG

Comment Type **E** *Comment Status* **X**

Editorial:The title is too long and overflows the TOC, requiring manual editor intervention.

Suggested Remedy

Clause 68, phy... ==> Clause 68

Response *Response Status* **O**

Cl **68** *SC* **68.10.1** *P* **36** *L* **12** # **128**

Booth, Brad Intel

Comment Type **E** *Comment Status* **X**

Missing the word ""Clause"" before the clause number.

Suggested Remedy

As per comment.

Response *Response Status* **O**

Cl **68** *SC* **68.10.1** *P* **36** *L* **13** # **129**

James, David JGG

Comment Type **E** *Comment Status* **X**

Its unclear what is the meaning of can be found in 21.

Suggested Remedy

If this is a clause, then state Clause 21.

Response *Response Status* **O**

Cl **68** *SC* **68.10.1** *P* **36** *L* **9** # **130**

James, David JGG

Comment Type **E** *Comment Status* **X**

Wrong capitalization. The title starts with a capital.

Suggested Remedy

physical medium dependent ==> Physical medium dependent

Response *Response Status* **O**

Cl **68** *SC* **68.10.2.1** *P* **36** *L* **17** # **131**
Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**
Extra dot

Suggested Remedy
Remove

Response *Response Status* **O**

Cl **68** *SC* **68.10.2.3** *P* **37** *L* **7** # **132**
James, David JGG

Comment Type **E** *Comment Status* **X**
Consistent centering

Suggested Remedy
Center the following columns, here and througout. Item Clause/Subclause Status Support

Response *Response Status* **O**

Cl **68** *SC* **68.10.3** *P* **37** *L* **23** # **133**
James, David JGG

Comment Type **E** *Comment Status* **X**
Editorial:The title is too long and overflows the TOC, requiring manual editor intervention.

Suggested Remedy
for physical medium dependent... ==> for Clause 68

Response *Response Status* **O**

Cl **68** *SC* **68.10.3.1** *P* **37** *L* **29** # **134**
Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**
No space to fill in form

Suggested Remedy
Insert space(s) between [and], quite a few times.

Response *Response Status* **O**

Cl **68** *SC* **68.10.3.1** *P* **37** *L* **41** # **135**
Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**
font size

Suggested Remedy
'Table 68-1' should be in 9 point.

Response *Response Status* **O**

Cl **68** *SC* **68.10.3.2** *P* **38** *L* **8** # **136**
Booth, Brad Intel

Comment Type **E** *Comment Status* **X**
Move the subclauses from the Value/Comment field into the subclause. Multiple subclauses can be referenced. Also, the ""c"" in the Value/Comment heading is lowercase while all the other are uppercase.

Suggested Remedy
Move subclause values and change ""c"" to uppercase.

Response *Response Status* **O**

Cl **68** *SC* **68.10.3.3** *P* **38** *L* **33** # **137**
Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**
Table 68-3 and Table 68-3? Should there be something else mentioned?

Suggested Remedy
Check - if nothing found, delete 'and Table 68-3'

Response *Response Status* **O**

Cl **68** *SC* **68.10.3.4** *P* **39** *L* **6** # **138**
Booth, Brad Intel

Comment Type **E** *Comment Status* **X**
""Per definition."" is not required in the Value/Comment field as it is assumed.

Suggested Remedy
Remove all the ""Per definition."" statements.

Response *Response Status* **O**

Cl **68** *SC* **68.10.3.4** *P* **39** *L* **6** # **139**

Dawe, Piers — Agilent

Comment Type **E** *Comment Status* **X**

Most of the table entries don't have a full stop

Suggested Remedy

At discretion

Response *Response Status* **O**

Cl **68** *SC* **68.10.3.5** *P* **39** *L* **36** # **140**

Booth, Brad — Intel

Comment Type **E** *Comment Status* **X**

Take the subclauses out of the Value/Comment field and put it in the Subclause field. It is okay to list multiple subclauses in this field.

Suggested Remedy

As per comment.

Response *Response Status* **O**

Cl **68** *SC* **68.10.3.5** *P* **39** *L* **40** # **141**

Dawe, Piers — Agilent

Comment Type **E** *Comment Status* **X**

Grammar?

Suggested Remedy

Delete 'the' before 'IEC 60825-1'?

Response *Response Status* **O**

Cl **68** *SC* **68.10.3.6** *P* **40** *L* **11** # **142**

Dawe, Piers — Agilent

Comment Type **E** *Comment Status* **X**

Wrong subclause?

Suggested Remedy

Change '68.5.1' to '68.9.3'?

Response *Response Status* **O**

Cl **68** *SC* **68.4** *P* **16** *L* # **143**

Arthur, Marris — Cadence

Comment Type **T** *Comment Status* **X**

The word ""should"" is used three times on pages 16. This word is deprecated in the style guide. Similarly review the use of the word ""must"" on pages 19 and 42.

Suggested Remedy

Consider changing ""should"" to ""shall"" on page 16 and review the other places in the document where the word 'should' is used. Similarly review the use of the word ""must"" on pages 19 and 42.

Response *Response Status* **O**

Cl **68** *SC* **68.4.1** *P* **14** *L* **26** # **144**

Dawe, Piers — Agilent

Comment Type **TR** *Comment Status* **X**

This sentence: 'The optical launch condition at TP2 may be either the default or the alternative launch, as specified in Table 68-3.' says that someone can choose which launch. Usually with a 'may', the implementer (equipment supplier) can choose, but not this time. It's misleading.

Suggested Remedy

Change to: 'The optical launch condition at TP2 is either the default or the alternative launch (at the user's choice), as specified in Table 68-3. A compliant PMD shall support both options.' Add a PICS item for the shall.

Response *Response Status* **O**

Cl **68** *SC* **68.4.1** *P* **14** *L* **26** # **145**

Booth, Brad — Intel

Comment Type **T** *Comment Status* **X**

Do you mean to directly reference the table or the transmitter optical specs.

Suggested Remedy

Change Table 68-3 to 68.5.1.

Response *Response Status* **O**

Cl **68** *SC* **68.4.1** *P* **14** *L* **38** # **146**

James, David JGG

Comment Type **E** *Comment Status* **X**

The figure font is nonstandard.

Suggested Remedy

Use 8-point Arial.

Response *Response Status* **O**

Cl **68** *SC* **68.4.1** *P* **14** *L* **50** # **147**

Arthur, Marris Cadence

Comment Type **T** *Comment Status* **X**

What is a system bulkhead? Either explain this in the text or add a definition for it in Clause 1.

Suggested Remedy

What is a system bulkhead? Either explain this in the text or add a definition for it in Clause 1.

Response *Response Status* **O**

Cl **68** *SC* **68.4.3** *P* **15** *L* **11** # **148**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

In these functional primitives, '.indicate' is now deprecated and '.indication' preferred.

Suggested Remedy

Change '.indicate' to '.indication', three times.

Response *Response Status* **O**

Cl **68** *SC* **68.4.4** *P* **15** *L* **17** # **149**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

If PMD_SIGNAL.indicate (SIGNAL_DETECT) is a function of a variable there wouldn't be a space before the (. See 52.1.1 for other examples.

Suggested Remedy

Either explain what parts of speech these things are, or remove the space.

Response *Response Status* **O**

Cl **68** *SC* **68.4.4** *P* **15** *L* **27** # **150**

Dawe, Piers Agilent

Comment Type **T** *Comment Status* **X**

We should warn the reader of a wrinkle if he intends the informative receiver test to work.

Suggested Remedy

Add informative 'NOTE - In order to count received errors in the informative simple stressed receiver sensitivity test, it may be convenient for the SIGNAL_DETECT value to be OK between the simple stressed receiver sensitivity in OMA and the received power in OMA (min), both in Table 68-4.'

Response *Response Status* **O**

Cl **68** *SC* **68.4.4** *P* **15** *L* **31** # **151**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Gratuitous capital in header row of table 68-1

Suggested Remedy

Change 'Conditions' to 'conditions'.

Response *Response Status* **O**

Cl **68** *SC* **68.4.4** *P* **15** *L* **44** # **152**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Bad use of 'etc.': there is no list to define what the others are, not formal enough (should be spelt out if used at all).

Suggested Remedy

Change to 'and so on' or 'and so forth'.

Response *Response Status* **O**

Cl **68** *SC* **68.4.7** *P* **15** *L* **19** # **153**

Claseman, George Micrel

Comment Type **E** *Comment Status* **X**

""PMD Transmit Disable 0 is not used for serial PMDs."" Neither are Disables 1-3.

Suggested Remedy

Include Disables 1-3.

Response *Response Status* **O**

Cl **68** *SC* **68.4.7** *P* **16** *L* **19** # **154**

Grow, Robert Intel

Comment Type **E** *Comment Status* **X**

Wrong font.

Suggested Remedy

Pleas apply the correct paragraph style.

Response *Response Status* **O**

Cl **68** *SC* **68.4.7** *P* **16** *L* **19** # **155**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Gratuitous capitals

Suggested Remedy

Change 'Transmit Disable' to 'transmit disable'.

Response *Response Status* **O**

Cl **68** *SC* **68.4.7** *P* **16** *L* **9** # **156**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Gratuitous capital

Suggested Remedy

Change 'Transmitter' to 'transmitter'.

Response *Response Status* **O**

Cl **68** *SC* **68.5** *P* **16** *L* **44** # **157**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

'which' or 'that'? See style guide or a good dictionary; in formal writing, use 'that' with a restrictive clause. Also precedent of clauses 38 52 ('that'), 58 59 60 ('which').

Suggested Remedy

Change 'which' to 'that'.

Response *Response Status* **O**

Cl **68** *SC* **68.5** *P* **17** *L* **1** # **158**

CUNNINGHAM, DAVID AGILENT TECHNOLO

Comment Type **TR** *Comment Status* **X**

The meaning of operating range in Table 68-2 is different to that of other 10Gigabit Ethernet optical PMD's. Because of building cabling standards, and customer expectations, it is important that the range table states 300 m. The committee has heard this many times from systems vendors. The purpose of 10GBASE-LRM dictates a reasonable balance between the following: Support of FDDI-Grade fiber and lower-cost smaller form factor transceivers per the 10GBASE-LRM PAR parts 14.
10GBASE-LRM is not and was never meant to be the only option for supporting legacy multimode fiber within IEEE 802.3. Rather it is meant to be an option that is architecturally compatible with lower power, smaller size, higher density and lower cost that customers may select to increase the operational life of their legacy multimode fiber installations. 10GBASE_LX4 has already addressed the burden of providing a PMD that is essentially guaranteed to support 300 m of legacy fiber. Therefore, 10GBASE-LRM does not need to address this burden again. In fact, 10GBASE-LRM must be different and must provide another value proposition to the customer.
The customer has three options, 10GBASE-LX4, 10GBASE-LRM or install new fiber and use 10GBASE-LR or 10GBASE-SX. To enable customers to make an educated choice clarify the meaning of the Operating range in Table 68-2.

Suggested Remedy

After Table 68-2 insert a Figure 68-x Percentile coverage of randomly selected 62.5/125 FDDI-grade multimode fiber
Points for graph are:
(0 m, 100 %), (220 m, 100%), (300 m, 95%), (500 m, 50 %).
Draw smooth line through the first two points. Draw a smooth curve through the last three points. X-axis title: Link length (m) Y-axis title: Percentage coverage (%) Insert text: In order to provide a balance between support for installed legacy multimode fiber and the following: lower-power, higher density, lower-cost, 10GBASE-LRM trades-off the percentile coverage as a function of operating range. This trade-off is illustrated in figure 68-x. From figure 68-x it can be seen that 10GBASE-LRM supports the vast majority of legacy 62.5/125 multimode fiber with length of 300m and all legacy 62.5/125 multimode fiber of length less than 220 m.

Response *Response Status* **O**

Cl **68** *SC* **68.5** *P* **17** *L* **10** # **159**

Mei, Richard SYSTIMAX Solutions

Comment Type **TR** *Comment Status* **X**

There was no modeling work done on the 500/500 MHz-km and 400/400 MHz-km grades of 50 um fibers in the installed base. The supportable distances are not substantiated until this work in complete.

Suggested Remedy

Response *Response Status* **O**

Cl **68** *SC* **68.5** *P* **17** *L* **10** # **160**

Kolesar, Paul Systimax

Comment Type **TR** *Comment Status* **X**

In Table 68-2, the maximum operating range for 50 um fibers with 500/500 and 400/400 MHz-km modal bandwidths have not been substantiated by simulation or experimental data. The properties of populations of these fibers are substantially different from 62.5 um and OM3 fibers so that they must be analyzed independently for each 50 um fiber type. For example, all specifications for operation on 62.5 and OM3 fibers were based on analysis with fibers having no less than 500 MHz-km bandwidth at 1300 nm. In addition the installed base of 50 um fibers with 500/500 bandwidth has a distinctly different bandwidth distribution than that of 62.5 um fibers.

Suggested Remedy

Perform necessary analysis and experiments to determine actual range limits. To that end, the Task 1 Channel Modeling ad-hoc group have been developing ""worst case"" fiber models for 50 um fibers of similar sort to that of the 108-fiber model developed for 62.5 um fibers. This work must be brought to completion and the results applied to determine actual operating ranges on the 500/500 and 400/400 MHz-km grades of 50 um fiber. Monte Carlo models or, preferably, actual fiber data will also be required to analyze statistical distributions and the dual launch approach.

Response *Response Status* **O**

Cl **68** *SC* **68.5** *P* **17** *L* **15** # **161**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Missing space

Suggested Remedy

Change '1.5dB' to '1.5 dB'.

Response *Response Status* **O**

Cl **68** *SC* **68.5** *P* **17** *L* **3** # **162**

Dawe, Piers Agilent

Comment Type **T** *Comment Status* **X**

The three footnotes c d e to table 68-2 are messy (and partly in the wrong size font). Note that IEC 60793-2-10 uses different nomenclature (A1a and so on) as used in our objectives; is it worth adding that also? Do we (or the world) need both? If both are current, it would be very helpful to the reader to decode them, and this table is an ideal place to do it.

Suggested Remedy

Insert a new second column 'Fiber name per ISO/IEC 11801: 2002' with three entries OM1 OM2 OM3 (in rows 3 4 6). Insert a new third column 'Fiber name per IEC 60793-2-10' with five entries A1b A1b A1a A1a.1 A1a.1 A1a.2. Remove existing footnotes c d e. Change the table title to '10GBASE-LRM operating ranges and fiber types'. Add IEC 60793-2-10 to references section 1.3 per another comment. Or if that's too much: Insert a new second column 'Fiber name' with three entries OM1 OM2 OM3 (in rows 3 4 6). Remove existing footnotes c d e. Insert new footnote 'c These names are used in ISO/IEC 11801: 2002.' Change the table title to '10GBASE-LRM operating ranges and fiber types'.

Response *Response Status* **O**

Cl **68** *SC* **68.5** *P* **17** *L* **3** # **163**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

The maximum channel insertion loss is the loss as seen by a power meter (near to overfilled launch; the loss a compliant LRM signal could suffer is less, as the launch is more tightly controlled. This needs to be mentioned.

Suggested Remedy

Extend footnote b 'Channel insertion loss is that measured by an instrument. Loss of a 10GBASE-LRM signal may be less.' And see other comments.

Response *Response Status* **O**

Cl **68** *SC* **68.5** *P* **17** *L* **5** # **164**

Booth, Brad Intel

Comment Type **ER** *Comment Status* **X**

This is a 1300 nm PMD, and the 850nm modal bandwidth is not relevant. There is only one modal bandwidth on 62.5 um fiber and two on 50 um fiber.

Suggested Remedy

Remove the 850 nm modal bandwidth numbers and condense the table to show only the 3 different modal bandwidths and operating ranges for 1300 nm.

Response *Response Status* **O**

Cl **68** *SC* **68.5** *P* **17** *L* **78** # **165**

Abbott, John — Corning Incorporated

Comment Type **TR** *Comment Status* **X**

The long standing philosophy in 802.3 is to employ worst case design values to ensure a robust system. The LRM specifications need to balance requirements for (a) worst case design (i.e. failure rate of less than 1%); (b) functional objectives (i.e. 300m & BER<10^-12), and (c) low cost/complexity (i.e. PIE-D = 5dB). The ISI parameters in Table 68-4 for the comprehensive stressed receiver test are not consistent with a 1% duplex link failure rate based on Monte Carlo modeling with the Gen67YY data set; nor are they consistent with a 1% single channel failure rate based on calculations using actual 98-99 fiber DMD data. Hence the link length will need to be reduced so that (a)-(b)-(c) are all met.

Suggested Remedy

The specific suggested remedy based on simulation results and actual fiber DMD data is to reduce the length 15% to 255m in table 68-2 p.17 lines 7-9 for 62.5.um fiber. The required change in target length needs to be finalized by 802.3aq once the complexity (c) is finalized.

Response *Response Status* **O**

Cl **68** *SC* **68.5** *P* **18** *L* **9** # **166**

Abbott, John — Corning Incorporated

Comment Type **TR** *Comment Status* **X**

The center wavelength range of the laser in table 68-3 is 1260-1355nm. A calculation has been done to determine the impact on failure rate as the laser wavelength is shifted from 1300 to 1355nm. A similar calculation was done by TIA during the development of the OM3 product (see Pepeljugoski et al., JLT vol.21 No.5 May 2003 p.1273 figure 17); in that case the failure rate increased by 0.3% as the wavelength shifted 5nm off of 850nm. Calculations based on the Gen67YY Monte Carlo set indicate that shifting from 1300 to 1355nm increases the failure rate between .75%(PIE-D=5) and 1.5%(PIE-D=4) depending on PIE-D required. Hence the target length will need to be reduced slightly.

Suggested Remedy

The specific suggested remedy based on simulation results is to reduce the LRM length by 10% to 270m in table 68-2 p.17 lines 7-9 for 62.5.um fiber. The calculation of the required change in target length needs to be verified by the 802.3aq LRM task force. The calculation will need to be repeated and the target length will change if there are adjustments in the required complexity (c) [PIE-D implicit in comprehensive stressed receiver test] and target % failure rate [coverage of installed base]. A similar effect is expected with OM3 fiber.

Response *Response Status* **O**

Cl **68** *SC* **68.5.1** *P* **18** *L* # **167**

Weiner, Nick — Phyworks

Comment Type **TR** *Comment Status* **X**

Transmit signal rise and fall times: For all analysis leading to the development of the clause and receiver tests in particular, transmit signal rise and fall times of 47ps has been assumed. For link behaviour as predicted by the analyses, this rise and fall time needs to be achieved. New transmitter parameter suggested, togeher with test pattern and measurement method subclause.

Suggested Remedy

New row for Table 68-3 (transmit characteristics): ""Signal rise time and fall time (20 % to 80 %)"" ""max"" ""47"" ""ps"". New row for Table 68-5 (test patterns): ""Transmit signal rise and fall times"" ""Square, ten ONEs and ten ZEROs"" ""68.6.X"" New subclause (after 68.6.5): 68.6.X Transmitted signal rise and fall time The transmitted signal rise and fall times are measured between 20 % of the OMA above the mean logic ZERO value and 20 % of the OMA below the mean logic ONE value.

Response *Response Status* **O**

Cl **68** *SC* **68.5.1** *P* **18** *L* **11** # **168**

Dawe, Piers — Agilent

Comment Type **E** *Comment Status* **X**

It's the width that needs the footnote, not the spectral.

Suggested Remedy

Move the 'a' to after 'width'.

Response *Response Status* **O**

Cl **68** *SC* **68.5.1** *P* **18** *L* **13** # **169**

Kolesar, Paul — Systimax

Comment Type **E** *Comment Status* **X**

Clarify and simplify spectral width specification in Table 68-3.

Suggested Remedy

Combine the second and third lines into one line that states: ""RMS spectral width from 1300 nm to 1355 nm"".

Response *Response Status* **O**

Cl **68** *SC* **68.5.1** *P* **18** *L* **15** # **170**

Dawe, Piers Agilent

Comment Type **T** *Comment Status* **X**

Is it right to call the power at TP2 'launch' power? Its meaning will depend on where the reader thinks the point of launch is. At the MDI? at TP2? At a transition point in the patch cord? The term 'launch power' is used quite a few times in 802.3 but apparently is not defined in 802.3.

Suggested Remedy

Change 'Launch power in OMA' to 'Power at TP2 in OMA'. Change 'Average launch power' to 'Average power at TP2'. Then we can simplify footnote b, and the new footnote proposed by another comment, to start with 'TP2 is after each type of patch cord.'

Response *Response Status* **O**

Cl **68** *SC* **68.5.1** *P* **18** *L* **15** # **171**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

We need to be more explicit about the effect the patch cord will have on measured optical power at TP2. Also, the sentiment of note b applies to average launch power as well as OMA. For info, the loss of the single-mode fiber offset-launch mode-conditioning patch cord is specified in 38.11.4 and 59.9.5. See another comment about rewording footnote b.

Suggested Remedy

Extend note b: 'Note that the patch cord between the MDI and TP2 may cause a loss of 0 to 0.5 dB.' Mark the two 'Average launch power's with a new note c, 'These average power specifications apply at TP2. This is after each type of patch cord. Note that the patch cord between the MDI and TP2 may cause a loss of 0 to 0.5 dB.'. In addition, we may wish to write this up in a new subclause in the measurements section.

Response *Response Status* **O**

Cl **68** *SC* **68.5.1** *P* **18** *L* **28** # **172**

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **X**

Footnotes c and d are unnecessary and misleading. Basically, all the parameters in these tables are defined in 68.6 Definitions of optical parameters and measurement methods. The reader knows that because 68.5.1 says '... specifications given in Table 68-3 ... per definitions in 68.6.' Following footnotes c and d, the lack of a footnote to 'Uncorrelated jitter (rms)' implies that this parameter is not defined or explained in 68.6, but that is not the case.

Suggested Remedy

Delete footnotes c and d.

Response *Response Status* **O**

Cl **68** *SC* **68.5.1** *P* **18** *L* **28** # **173**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

The eye mask coordinates might need minor tweaking when we know more about the range of acceptable transmitters from the TP2 study. I do not wish to adjust them now but I am logging this comment to put the issue on the living list.

Suggested Remedy

When the TP2 study is complete and TWDP is settled, review the eye mask coordinates for consistency (should be a little bit easier than TWDP), and make small changes if necessary.

Response *Response Status* **O**

Cl **68** *SC* **68.5.1** *P* **18** *L* **30** # **174**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

The TWDP limit must be revised to agree with what cost-effective transmitters can do. It is not obvious that the stressors need be included in TWDP at all, and their inclusion may (dis)favour specific transmitters against equivalently useful transmitters according to the choices made in defining the three stressors. This is another comment that we may not be able to close for a while. Note that TWDP is the best thing we have; we do need a relevant test of transmitter quality, and eye mask is not relevant enough. 'Just get rid of TWDP' is not a practical option.

Suggested Remedy

Investigate the usefulness of a 'TWP' metric without emulated fibers. If this doesn't work, consider whether the relevant criterion is the worst of the three cases, the worst difference to PIE-D or PIE(n,m) of the Gaussian reference transmitter with those cases, the mean of the three cases, the mean of the three differences, or what. Choose a new and suitable limit.

Response *Response Status* **O**

Cl **68** *SC* **68.5.1** *P* **18** *L* **46** # **175**

Kolesar, Paul Systimax

Comment Type **E** *Comment Status* **X**

State launch condition specifications more clearly and uniformly in Table 68-3.

Suggested Remedy

The first column for each of the three launch condition rows can be formatted as follows: Optical launch specification^e for <fiber type>: (^e refers to footnote e) Default Alternative The encircled flux specifications in the third column for all three fiber types can be clarified by stating them as follows: 30% encircled flux within 5um radius 86% encircled flux within 11um radius Delete all ""%"" in the fourth column, as redundant with information in column three. In column one, reference footnote f for each launch that has an encircled flux specification by placing superscript f after either ""alternative"" or ""default"" as appropriate. Modify footnote f to read: ""This encircled flux specification defines the native launch directly into a patch cord of the same fiber type as that of the supported cable plant when measured per IEC 61280-1-4 or ANSI/TIA/EIA-455-203.""

Response *Response Status* **O**

Cl **68** *SC* **68.5.1** *P* **18** *L* **46** # **176**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

In table 68-3, mode conditioning patch cord doesn't have units of %.

Suggested Remedy

Delete % in the 'Unit' column, twice.

Response *Response Status* **O**

Cl **68** *SC* **68.5.1** *P* **18** *L* **46** # **177**

Ewen, John JDS Uniphase

Comment Type **TR** *Comment Status* **X**

Table 68-3. Simulations using the OM3 Monte Carlo model suggest there is little or no benefit obtained using the alternative launch. The simulated 99th percentiles of PIE-D for OM3 fiber, using a 1-1-300-1 link configuration with Rayleigh distributed connector offsets truncated at 7um is: center launch: 4.56 dBo offset launch: 6.48 dBo ""best"" launch: 4.51 dBo The improvement in PIE-D is about 0.05dB using the best of either center or offset launch relative to center launch alone.

Suggested Remedy

Delete line 46 from Table 68-3, i.e. delete the text ""Alternative Launch"" and ""Mode conditioning patch cord as specified in 38.11.4 or 59.9.5""

Response *Response Status* **O**

Cl **68** *SC* **68.5.1** *P* **19** *L* **2** # **178**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Missing space

Suggested Remedy

Change to 'launches. The'

Response *Response Status* **O**

Cl **68** *SC* **68.5.1** *P* **19** *L* **5** # **179**

Dawe, Piers Agilent

Comment Type **T** *Comment Status* **X**

What's the difference between IEC 61280-1-4 and ANSI/TIA/EIA-455-203-2001? If they say the same, I think policy is to refer to just the international standard. Is there a concordance table to map between TIA and IEC standards anywhere on the web? If so, perhaps we could refer to that in the references section, along with the standards bodies' addresses.

Suggested Remedy

After review, delete 'or ANSI/TIA/EIA-455-203-2001'

Response *Response Status* **O**

Cl **68** *SC* **68.5.1** *P* **19** *L* **7** # **180**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Why doesn't figure 68-3 come between table 68-3 and table 68-4? Is it a Frame thing or a tag in the wrong place?

Suggested Remedy

If the latter, fix.

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **16** *L* **20** # **181**

Claseman, George Micrel

Comment Type **E** *Comment Status* **X**

""Also, for information, channels responses...""

Suggested Remedy

""Also, for information, channel responses...""

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **16** *L* **4** # **182**

Claseman, George Micrel

Comment Type **E** *Comment Status* **X**

Table 68-2 refers to 850nm, but clause 68 covers 1300 only.

Suggested Remedy

Remove 850nm references?

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **17** *L* **20** # **183**

Grow, Robert Intel

Comment Type **ER** *Comment Status* **X**

Shouldn't this paragraph be a NOTE since it is just for information. If it is really specifying something, the language should be corrected.

Suggested Remedy

Change to a NOTE.

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **17** *L* **21** # **184**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

'channels responses'?

Suggested Remedy

Change to 'channel responses'.

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **17** *L* **7** # **185**

James, David JGG

Comment Type **E** *Comment Status* **X**

The outside lines look too thick.

Suggested Remedy

Should be thin.

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **19** *L* **18** # **186**

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **X**

Footnotes a and e are unnecessary. The reader knows to look in 68.6 because 68.5.1 says '... specifications given in Table 68-4, per definitions in 68.6.'

Suggested Remedy

Delete footnotes a and e.

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **19** *L* **21** # **187**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

If we can establish the predictable difference in connector and splice loss between the loss measured by a loss test set and the loss suffered by an LRM signal (tighter launch), we can move all the receiver sensitivity and receiver and signal minimum powers up by that amount.

Suggested Remedy

Investigate the predictable difference; if it is significant move all the receiver sensitivity and receiver and signal minimum powers up by that amount.

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **19** *L* **21** # **188**

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **X**

'Received power in OMA' could be better named - it's not specific at present.

Suggested Remedy

Change to 'Lowest received power in OMA'. Consider removing 'min'.

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **19** *L* **26** # **189**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

I suspect that our understanding of noise bandwidth is wrong. Either or both of the name and the limit value may need to be changed.

Suggested Remedy

Revise following validation and correction of comprehensive stressed receiver tests.

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **19** *L* **26** # **190**

Booth, Brad Intel

Comment Type **E** *Comment Status* **X**

Line weight too heavy for sub-parameters.

Suggested Remedy

Decrease line weight.

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **19** *L* **27** # **191**

Aronson, Lew Finisar

Comment Type **T** *Comment Status* **X**

Table 68-4 Recent discussion has indicated that the noise loading for the Comprehensive Stressed Receiver test is probably to large. In particular, the noise corrseponding to the specified maximum transmitter RIN would yield Qsq = 29. No new calculation has been done for the modal noise, but it appears likely that it will result in a larger Qsq than the curren 11.5.

Suggested Remedy

Calculate the RIN noise contribution directly from the RIN specification in the TP2 table, and calculate the modal noise contribution based on the latest link model.

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **19** *L* **28** # **192**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

The limit of Qsq is wrong (too much noise). Depending how we fix the comprehensive stressed receiver tests, we may need to go to a noise/Hz definition.

Suggested Remedy

Revise any and all of the name, definition and the limit value in this row following validation and correction of comprehensive stressed receiver tests.

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **19** *L* **28** # **193**

Weiner, Nick Phyworks

Comment Type **T** *Comment Status* **X**

Qsq for receiver comprehensive stress test signals: More detailed analysis required. At the very least, the budgetted penalty for RIN and modal noise leads to Qsq value of 12. But both analysis method and budget could use more attention.

Suggested Remedy

Change Qsq value to 12.

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **19** *L* **28** # **194**

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **X**

Table 69-4 footnote d (to Qsq) duplicates material in 68.6.7 and 68.6.9. The only thing that it really does is substitute for a name in words by Qsq so that the reader can navigate to the appropriate parts of 68.6.

Suggested Remedy

If we stay with Qsq, insert 'Test transmitter signal to noise ratio' before 'Qsq'. Change footnote d to 'Transmitter signal to noise ratio is defined in 68.6.7 but its use here is qualified by 68.6.9.3.'

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **19** *L* **30** # **195**

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **X**

We can give this item a shorter, clearer, more familiar name. See another comment for some of the reasoning.

Suggested Remedy

Change 'Spacing, Delta_t, of pulses defining ISI generator response' to 'Transversal filter tap spacing, Delta_t'

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **19** *L* **31** # **196**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

These 'ISI parameters' are wrong. Parameters must be chosen with regard to the project's priorities of cost, heat, size and timescale. Also, we need to be sure that the _combination_ of pulse spreading and noise loading is acceptable for 2005-vintage equalising receivers, so at time of writing I can't sign off even my best guess.

Suggested Remedy

My best guess parameters are:
0.168 0.188 0.527 0.117,
0.000 0.513 0.000 0.487,
0.254 0.453 0.155 0.138.

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **19** *L* **31** # **197**

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **X**

These 'ISI parameters' could do with a better name - they aren't directly parameters of ISI.

Suggested Remedy

Change 'ISI parameters' to 'tap weights' (three times in this table).

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **19** *L* **31** # **198**

Dawe, Piers Agilent

Comment Type **T** *Comment Status* **X**

Whatever 'ISI parameters' we end up with, they should be normalised so that low frequency gain = 1.

Suggested Remedy

When choosing new parameters, check each set adds up to 1.

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **19** *L* **31** # **199**

Aronson, Lew Finisar

Comment Type **T** *Comment Status* **X**

Table 68-4 The present TP3 ISI stressors appear to exceed the consensus on what can be achieved with low power and low cost today. New values need to be chosen to which meet this criteria

Suggested Remedy

Accept the recommendation of the TP3 ad hoc group for new stressor values

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **19** *L* **31** # **200**

CUNNINGHAM, DAVID AGILENT TECHNOLO

Comment Type **TR** *Comment Status* **X**

The three sets of ISI parameters need to be replaced by new ones. At the end of the last two meetings it was generally agreed that they were approximate placeholders. In addition, the methodology used to select the ISI stressors is flawed because it does not take into account the purpose of project 10GBASE-LRM per the approved PAR (see text from PAR). The purpose of 10GBASE-LRM dictates a reasonable balance between the following: Support of FDDI-Grade fiber and lower-cost smaller form factor transceivers per the 10GBASE-LRM PAR parts 14. The stress test stressors should not be based on PIE_D values of worst-case link scenarios. Rather to allow lower cost, lower power implementations, the stressors should be back-off from the worst-case PIE_D values. This approach would mimic the proven methodology used by Gigabit Ethernet in the original development of SRS conformance tests for Ethernet. The objectives for the stress test should be: a) With reasonable confidence disallow poor EDC implementations (e.g.: insufficiently long FFE section, very noisy optical-equalizer combinations). b) Ensure that a compliant receiver can recover valid but highly stressed signals. In common with Gigabit Ethernet the LRM stress signals should not be worst-case stress signals.

Suggested Remedy

I believe that new stressors are to be proposed for the comment review meeting. If they are closer to 4 dBo PIE_D equivalent than 4.5 dBo PIE_D equivalent I am likely to support them.

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **19** *L* **31** # **201**

Weiner, Nick Phyworks

Comment Type **TR** *Comment Status* **X**

Receiver test parameter values in Draft 2.0 were suggested in before our current method for deriving the values was developed. We now have values that have been carfully derived, considering real world implementation factors, to facilitate rapid introduction of low cost, low power 10GBASE-LRM implementations. Together with the other 10GBASE-LRM compliance tests, the resulting receiver test will ensure robust performance of 10GBASE-LRM in the field.

Suggested Remedy

Pre-cursor values: 0.168 0.188 0.527 0.117
Symmetrical values: 0.000 0.513 0.000 0.487
Post-cursor values: 0.254 0.453 0.155 0.138

Response *Response Status* **O**

Cl **68** SC **68.5.2** P **19** L **37** # **202**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

Notice that the signal level for the simple stressed receiver test is not a compliant signal. This could cause problems with signal detect and could be outside the dynamic range of the receiver. I see two options: warn people, or change the signal level until it is compliant.

Suggested Remedy

For first option: add a replacement footnote e: 'Note that this signal level is outside the range of compliant signals'. For second option: eliminate the row, make the simple stressed receiver procedure refer to the comprehensive stressed receiver sensitivity in OMA. Then delete 'Comprehensive' from line 22 (but not from line 24). See another comment for removal of existing footnote e.

Response *Response Status* **O**

Cl **68** SC **68.5.2** P **19** L **39** # **203**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

There's only one simple stressed receiver test.

Suggested Remedy

Change 'tests' to 'test'.

Response *Response Status* **O**

Cl **68** SC **68.5.2** P **19** L **41** # **204**

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **X**

It would help the reader to add a footnote letting him know that this is the filtered risetime, and giving the other risetime. The difference is not large but it is significant. See style guide for different types of notes to tables: we want an informative one so that in case of disagreement, it is clear which definition of risetime has precedence. We could also give the equivalent bandwidth of the filter, but I think the consensus is that it isn't necessary.

Suggested Remedy

Add table note or table footnote: 'NOTE - These times are as seen through a standard 7.5 GHz Bessel-Thomson response. The unfiltered time is X ps.' Substitute a real number for X; it may be about 3 ps less than the filtered risetime.

Response *Response Status* **O**

Cl **68** SC **68.5.2** P **19** L **41** # **205**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

Rise time for simple stressed receiver test needs to be appropriately related to comprehensive stressed test tap weights. We will need to consider the metric for comparison, the desired deliberate offset, implications of noise loading and of difference in signal levels. We should pick a new rise time that is easier for the receiver than the comprehensive stressed receiver sensitivity spec by an amount to cover experimental tolerances.

Suggested Remedy

Considering all the above, choose a new rise time that is a little easier for the receiver than the comprehensive stressed receiver sensitivity spec.

Response *Response Status* **O**

Cl **68** SC **68.5.2** P **19** L **41** # **207**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Three cells seem to be bottom aligned while the rest are centered vertically.

Suggested Remedy

Reconcile.

Response *Response Status* **O**

Cl **68** SC **68.5.2** P **19** L **48** # **208**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

If this is a table of receiver properties, the 'Average receive power' is a sort of tolerance or overload spec.

Suggested Remedy

Change 'Average receive power' to 'Highest average receive power', change 'max' to 'min'.

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **19** *L* **50** # **209**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

The entry for 'Average received power (informative) min' in table 68-4 is causing confusion. It doesn't really belong in a table of receiver properties at all. We can make footnote g clearer, but a more thorough solution is as below. This seems like overkill but it's a long-running problem that needs fixing. This remedy also goes some way to providing the information required by those who ask 'where's the budget table?'.

Suggested Remedy

In a new subclause 68.5.3, create a new table with the same four columns and headings as this one. Title 'Characteristics of a compliant 10GBASE-LRM signal to be received (informative)'.

Rows as follows:

Highest power in OMA	max	+1.5	dBm
Lowest power in OMA	min	-6.5	dBm
Highest average power	max	0.5	dBm
Lowest average power	min	-8.5	dBm

Notice that these items really are min and max of a range; min and max should be mostly the opposite way round to table 68-4, where min and max isn't so simple.Remove the row 'Average received power (informative)' from table 68-4, and its footnote g.

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **20** *L* **1** # **210**

Dawe, Piers Agilent

Comment Type **T** *Comment Status* **X**

The received power in OMA (min) spec is used not only in the signal detect function specification but also in the jitter tolerance specification.

Suggested Remedy

Change to 'Received power in OMA (min) is used in the signal detect function specification and the jitter tolerance specification.'

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **20** *L* **2** # **211**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

This sentence is still confusing: 'A received power in OMA below this value cannot be compliant...'. The point is that the table entry should tell the reader when the _signal_ (anywhere in the fiber, before reception) is compliant.

Suggested Remedy

Change to 'A signal with an OMA below this value cannot be compliant...'

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **20** *L* **3** # **212**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

I suspect we have messed up our noise calculations. On one definition, the noise bandwidth is NOT the -3 dB (electrical) point of the noise spectrum. With luck I will find the answer before the meeting! We have whole subclauses for explaining what test parameters mean, better to collect a complete story there and use footnotes here only when their absence could cause confusion. By the way, there should be a space between 3 and dB.

Suggested Remedy

Following investigations, put the relevant information in 68.6.9 (or revise this note).

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **20** *L* **7** # **213**

Thompson, Geoff

Comment Type **TR** *Comment Status* **X**

The receiver max input should be able to tolerate the max transmitter output likely to be encountered (plus margin) and be stated as such.

Suggested Remedy

Change the text that reads:
"f The receiver shall be able to tolerate, without damage, continuous exposure to an optical input signal having a power level equal to the average receive power (max) plus at least 1 dB."

To:
"f The receiver shall be able to tolerate, without damage, continuous exposure to an optical input signal having a power level equal to the average transmit power (max) of any 802.3 optical transmitter plus at least 1 dB."

Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **20** *L* **9** # **214**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

This sentence is still confusing: 'An average received power below this value cannot be compliant...'. The point is that the table entry should tell the reader when the _signal_ (anywhere in the fiber, before reception) is compliant.

Suggested Remedy

If footnote g hasn't been removed by another comment, change to 'A signal with an average power below this value cannot be compliant...'

Response *Response Status* **O**

Cl **68** *SC* **68.52** *P* **17** *L* **20** # **215**

George, John

Comment Type **TR** *Comment Status* **X**

Statement must be normative.

Suggested Remedy

Receivers will have to tolerate dynamically changing impulse response shapes and PIE-D with changes in polarization and fiber shaking. This has been shown is balemarthy_1_0105, king_1_1104, and meadowcroft_1_0105. Thus, the statement should clearly be identified as normative by removing the words "Also, for information".

Response *Response Status* **O**

Cl **68** *SC* **68.6** *P* **18** *L* **15** # **216**

Swenson, Norman ClariPhy Communicati

Comment Type **TR** *Comment Status* **X**

Table 68-3: Min OMA and Max OMA are not appropriate for specifying a transmit power when predistorion is permitted in the transmit waveform.

Suggested Remedy

A new measure of transmitted power needs to be defined in terms of the standard deviation of the transmitted power. It is this value that is directly related to the matched filter bound, which is currently used as a figure of merit for the TWDP test.

Response *Response Status* **O**

Cl **68** *SC* **68.6** *P* **18** *L* **15** # **217**

Dudek, Mike Picolight

Comment Type **T** *Comment Status* **X**

Receiver inputs are likely to have a peak input power limit in order to ensure linearity. With the possibility of using transmitters with significantly peaked output we should limit the peak Tx output power and also specify the peak input power that the receiver can operate with

Suggested Remedy

Insert an additional line in table 68-3 ""Peak Launch Power max = 2mW."" and inseta an additional line in table 68-4 ""Peak Received power min = 2mW""

Response *Response Status* **O**

Cl **68** *SC* **68.6** *P* **18** *L* **51** # **218**

Dudek, Mike Picolight

Comment Type **T** *Comment Status* **X**

In Table 68-3 Transmitter reflectance is an unnecessary specification for this multimode system.

Suggested Remedy

Delete this line from Table 68-3.

Response *Response Status* **O**

Cl **68** SC **68.6** P **19** L **31** # **219**

Telang, Vivek — Broadcom Corp

Comment Type **TR** *Comment Status* **X**

The values of the Precursor ISI parameters in the comprehensive stressed receiver tests have been shown to be not optimal (see John Ewen's presentation http://grouper.ieee.org/groups/802/3/aq/public/mar05/ewen_1_0305.pdf)

Suggested Remedy

Replace with the values from Row 23 of the Precursor worksheet from the spreadsheet ""Candidate TP3 Response Rev00.xls"" submitted by John Ewen to the reflector on 4/7/05. http://grouper.ieee.org/groups/802/3/10GMMFSG/email/xls00003.xls The parameters are: 0.354 0.038 0.412 0.196, separated by 0.75 UI

Response *Response Status* **O**

Cl **68** SC **68.6** P **19** L **33** # **220**

Telang, Vivek — Broadcom Corp

Comment Type **TR** *Comment Status* **X**

The values of the Symmetrical ISI parameters in the comprehensive stressed receiver tests have been shown to be not optimal (see John Ewen's presentation http://grouper.ieee.org/groups/802/3/aq/public/mar05/ewen_1_0305.pdf)

Suggested Remedy

Use the values from Row 22 of the Split-Symmetric worksheet from the spreadsheet ""Candidate TP3 Response Rev00.xls"" submitted by John Ewen to the reflector on 4/7/05: http://grouper.ieee.org/groups/802/3/10GMMFSG/email/xls00003.xls The parameters are: 0.086 0.387 0.096 0.430, separated by 0.75 UI

Response *Response Status* **O**

Cl **68** SC **68.6** P **19** L **35** # **221**

Telang, Vivek — Broadcom Corp

Comment Type **TR** *Comment Status* **X**

The values of the Postcursor ISI parameters in the comprehensive stressed receiver tests have been shown to be not optimal (see John Ewen's presentation http://grouper.ieee.org/groups/802/3/aq/public/mar05/ewen_1_0305.pdf)

Suggested Remedy

Use the values from Row 20 of the Postcursor worksheet from the spreadsheet ""Candidate TP3 Response Rev00.xls"" submitted by John Ewen to the reflector on 4/7/05: http://grouper.ieee.org/groups/802/3/10GMMFSG/email/xls00003.xls The parameters are: 0.256 0.397 0.110 0.237, separated by 0.75 UI

Response *Response Status* **O**

Cl **68** SC **68.6** P **19** L **44** # **222**

Smith, Grant — Aeluros

Comment Type **TR** *Comment Status* **X**

The jitter tolerance test provided by draft D2.0 only includes a single compliance point: 5UI & 40 kHz. This conflicts with 10GBASE-R, which specifies a full JTOL mask. However, both D2.0 and 10GBASE-R specify a transmitter eye mask test performed with a 4 MHz bandwidth reference CDR. This allows a valid transmitter for D2.0 with jitter up to 4 MHz which is attenuated by the reference CDR for the eye mask test, but which will be in the signal and will therefore stress the receiver.

Suggested Remedy

Insert sinusoidal jitter mask and table equivalent to 10GBASE-R, as drawn in IEEE 802.3ae, 52.8.1, including 4 MHz / 0.15UI corner

Response *Response Status* **O**

Cl **68** SC **68.6** P **20** L **16** # **223**

Ghiasi, Ali — Broadcom

Comment Type **E** *Comment Status* **X**

Pattern should be square wave and not ""Square""

Suggested Remedy

Response *Response Status* **O**

Cl **68** SC **68.6.1** P **17** L **37** # **224**

Dawe, Piers — Agilent

Comment Type **T** *Comment Status* **X**

This note 'Test patterns for specific optical tests are designed to emulate system operation, using standardized data patterns to represent valid 10GBASE-R data.' is a problem area. Some test patterns emulate system operation, some don't. None of them contain 'data' in the 'data is the [payload of] a frame' sense of the word. Most of them are not valid 10GBASE-R bitstreams, though most of them emulate it in certain aspects. I'm not sure what purpose the note serves.

Suggested Remedy

We could go back to the previous version: 'NOTE -Test patterns for specific optical tests are designed to emulate system operation, which would entail passing valid 10GBASE-R data.' Or better, do this and change 'specific' to 'certain' or 'some'. Or better still, eliminate the note.

Response *Response Status* **O**

Cl **68** *SC* **68.6.1** *P* **20** *L* # **225**

Weiner, Nick Phyworks

Comment Type **T** *Comment Status* **X**

Table 68-5. No test pattern specified for receiver jitter tolerance test. Same pattern as for simple receiver test proposed.

Suggested Remedy

New row for Table 68-5: ""Receiver jitter tolerance"" ""1 or 3"" ""68.6.11""

Response *Response Status* **O**

Cl **68** *SC* **68.6.1** *P* **20** *L* # **226**

Weiner, Nick Phyworks

Comment Type **T** *Comment Status* **X**

Table 68-5. No test pattern specified for calibration of noise for comprehensive receiver tests.

Suggested Remedy

New row in Table 68-5: ""Calibration of noise for receiver tests"" ""Square, ten ONEs and ten ZEROs"" ""68.6.9""

Response *Response Status* **O**

Cl **68** *SC* **68.6.1** *P* **20** *L* **19** # **227**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

Do we need ten ONEs and ten ZEROs? Won't eight do? Binary numbers may be easier to generate, especially with telecom-oriented test equipment. Note to self: do the simulation.

Suggested Remedy

If eight is satisfactory, change 'ten' to 'eight', twice.

Response *Response Status* **O**

Cl **68** *SC* **68.6.1** *P* **20** *L* **30** # **228**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Footnote a should be attached to the first occurrence of PRBS9.

Suggested Remedy

Move the superscript a to the first occurrence of PRBS9 in table 68-5 (around line 23).

Response *Response Status* **O**

Cl **68** *SC* **68.6.1** *P* **20** *L* **31** # **229**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

Unnecessary full stop

Suggested Remedy

Remove the . after (TWDP)

Response *Response Status* **O**

Cl **68** *SC* **68.6.1** *P* **20** *L* **35** # **230**

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **X**

As we are using this table as a table of contents for the definitions and methods section, it's worth including all the tests or specs, even ones where the choice of pattern is a don't-care.

Suggested Remedy

Between TWDP and wavelength, add a row: Encircled flux N/A See IEC 61280-1-4 Add rows for any other parameters or tests that we have overlooked. (RIN and optical return loss tolerance are already covered - part of transmitter signal to noise ratio.)

Response *Response Status* **O**

Cl **68** *SC* **68.6.1** *P* **20** *L* **45** # **231**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

Did we come to a conclusion on 511 bits vs. 512 bits? Is the following correct?

Suggested Remedy

Change 'is also acceptable' to 'has the advantage of balance but can cause triggering and aliasing problems'.

Response *Response Status* **O**

Cl **68** *SC* **68.6.10** *P* **19** *L* **37** # **232**

Dudek, Mike — Picolight

Comment Type **T** *Comment Status* **X**

The simple stressed receiver test should not be more stringent than the comprehensive stressed receiver test. The present test has an input power that is 1dB lower than the comprehensive test and a risetime equivalent to 4.75dB Pie-D. This should be relaxed

Suggested Remedy

In Table 68-4 change the ""Simple stressed rec eiver Sensitivity in OMA ""to match the ""Comprehensive Streessed receiver sensitivity in OMA"" value of -6.5dBm. Also change the ""Signal rise and fall times"" to 124ps to be equivalent to a Pie-D of 4.5dB.

Response *Response Status* **O**

Cl **68** *SC* **68.6.10** *P* **30** *L* **3654** # **233**

Thompson, Joey — Circadiant Sysytems, I

Comment Type **T** *Comment Status* **X**

The ""inforamtive"" stressed receiver test is potentially misleading and cannot be fixed because it will poorly correlate with the normative comprehensive stressed receiver test. Its inclusion will produce more confusion than it solves.

Suggested Remedy

Remove all of 68.6.10 !

Response *Response Status* **O**

Cl **68** *SC* **68.6.10** *P* **30** *L* **38** # **234**

Lindsay, Tom — ClariPhy Communicati

Comment Type **T** *Comment Status* **X**

Results may not match between informative and normative Rx tests. We have to tell the reader which he should use.

Suggested Remedy

Insert after the 1st sentence of the paragraph: If the BER results do not match results from the comprehensive test described in clause 68.6.9, the results of the comprehensive test are binding.

Response *Response Status* **O**

Cl **68** *SC* **68.6.10** *P* **30** *L* **46** # **235**

Dawe, Piers — Agilent

Comment Type **T** *Comment Status* **X**

Should we specify which type of MCPC?

Suggested Remedy

Add 'suitable for 62.5/125 um fiber'

Response *Response Status* **O**

Cl **68** *SC* **68.6.10** *P* **30** *L* **51** # **236**

Dawe, Piers — Agilent

Comment Type **E** *Comment Status* **X**

Finish sentence with full stop

Suggested Remedy

.

Response *Response Status* **O**

Cl **68** *SC* **68.6.10** *P* **30** *L* **51** # **237**

Dallesasse, John — Emcore Corporation

Comment Type **E** *Comment Status* **X**

Missing a period in the sentance ending ""stressed receiver test of 68.6.9""

Suggested Remedy

Add a period.

Response *Response Status* **O**

Cl **68** *SC* **68.6.10** *P* **30** *L* **54** # **238**

Dawe, Piers — Agilent

Comment Type **T** *Comment Status* **X**

Need to allow alternative but equivalent implementations of simple test. Strictly we don't need the words because it's informative anyway, but let us be kind to the reader!

Suggested Remedy

Add another paragraph (regular text, not NOTE): Other implementations may be used provided that the resulting signal in the optical domain matches that created using the implementation described.

Response *Response Status* **O**

Cl **68** *SC* **68.6.10** *P* **31** *L* **1** # **239**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Cleaning up the graphic

Suggested Remedy

Remove unused trailing zeros (both axes). Add graticule. Normalise to DC gain of 1 (stressors due to change anyway). Make the diagram the right size in Excel and don't resize it in Frame and the letter spacing should come out OK.

Response *Response Status* **O**

Cl **68** *SC* **68.6.10** *P* **31** *L* **14** # **240**

James, David JGG

Comment Type **E** *Comment Status* **X**

The figure font is nonstandard.

Suggested Remedy

Use 8-point Arial.

Response *Response Status* **O**

Cl **68** *SC* **68.6.10** *P* **31** *L* **24** # **241**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

arbitrary time values? You know exactly what the offset is/are!

Suggested Remedy

Change 'arbitrary time values)' to '6 UI' (if it is so). If it's not so simple, change 'offset from one another by arbitrary time values' to 'offset in time' or 'offset in time from one another' or similar.

Response *Response Status* **O**

Cl **68** *SC* **68.6.10** *P* **31** *L* **32** # **242**

James, David JGG

Comment Type **E** *Comment Status* **X**

The figure font is nonstandard.

Suggested Remedy

Use 8-point Arial.

Response *Response Status* **O**

Cl **68** *SC* **68.6.10** *P* **31** *L* **41** # **243**

Booth, Brad Intel

Comment Type **ER** *Comment Status* **X**

The word ""informative"" should be at the end of Figure 68-13's title.

Suggested Remedy

Move ""informative"" to be inside parantheses at the end of the title, ""(informative)"".

Response *Response Status* **O**

Cl **68** *SC* **68.6.10** *P* **31** *L* **50** # **244**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Unusual space between paragraphs?

Suggested Remedy

per comment

Response *Response Status* **O**

Cl **68** *SC* **68.6.10** *P* **32** *L* **3** # **245**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

The contents of table 68-12, and the labels in figure 68-12, will need revision as we change and renormalise the stressors.

Suggested Remedy

Follow other comments.

Response *Response Status* **O**

Cl **68** *SC* **68.6.11** *P* **31** *L* **54** # **246**

Dawe, Piers Agilent

Comment Type **T** *Comment Status* **X**

Should we specify which type of MCPC?

Suggested Remedy

Add 'suitable for 62.5/125 um fiber'

Response *Response Status* **O**

Cl **68** *SC* **68.6.11** *P* **32** *L* **1** # **247**

Thon, Lars — Aeluros Inc.

Comment Type **TR** *Comment Status* **X**

Draft D2.0 (and earlier versions) specifies a single point of compliance for the jitter tolerance test, namely 5UI at 40kHz. This is in contrast to 10Gbase-R, which specifies a full JTOL mask with corners at 5UI/40kHz and 0.15UI/4MHz, and extending at a constant 0.15UI limit from 4MHz up to 10*BW of the receiver CDR. At the same time, both D2.0 and 10Gbase-R specify that the **transmitter** eye mask test is performed with a 4MHz bandwidth reference CDR (or CRU). This means that a valid transmitter for 10Gbase-LRM may have jitter up to 4MHz, which is not visble d by the reference CDR for the purpose of the eye mask, but nevertheless may be present in the signal, and that will stress the receiver. For example, the LR mask permits 5UI at 40kHz 2UI at 100kHz 1UI at 200kHz

Suggested Remedy

The receiver JTOL test should be the same as in 10Gbase-R, or at least be specified up to the 4MHz/0.15UI corner.

Response *Response Status* **O**

Cl **68** *SC* **68.6.11** *P* **32** *L* **3** # **248**

Dawe, Piers — Agilent

Comment Type **E** *Comment Status* **X**

Capitals inside words

Suggested Remedy

Change '-Cursor' to '-cursor', twice

Response *Response Status* **O**

Cl **68** *SC* **68.6.11** *P* **32** *L* **7** # **249**

James, David — JGG

Comment Type **E** *Comment Status* **X**

Bad table lines.

Suggested Remedy

Use very-thin in the interior. Use thin on the boundary.

Response *Response Status* **O**

Cl **68** *SC* **68.6.11** *P* **33** *L* **14** # **206**

James, David — JGG

Comment Type **E** *Comment Status* **X**

The figure font is nonstandard.

Suggested Remedy

Use 8-point Arial.

Response *Response Status* **O**

Cl **68** *SC* **68.6.2** *P* **17** *L* **40** # **250**

CUNNINGHAM, DAVID — AGILENT TECHNOLO

Comment Type **TR** *Comment Status* **X**

The definition of OMA for Clause 68 is misleading. This is particularly true for pre-distorted NRZ signalling and ringing waveforms. The definition of 68.6.6 is really the steady state OMA. That is, it is the difference in the optical power level of long strings of ONE's and long strings of ZERO's. The actual OMA of a pre-distorted signal will be greater than the OMA per 68.6.6 by (PIE_D - TWDP) in dBo. That is, the apparent reduction in TWDP, for a distorted waveform, compared to the PIE_D of the standard NRZ waveform, is due entirely to the increased transmit OMA of the distorted signal. Severely, pre-distorted waveforms are allowed by both the current eye mask and TWDP. If pre-distortion is used the transmitter really does launch more power. It can be a lot more power. The standard should make this clear so that device, PMD and system designers can take this into account.

Suggested Remedy

Search D2.0 for OMA. Replace OMA with OMA_ss. Search D2.0 for ""Optical modulation amplitude"" replace with ""Steady state optical modulation amplitude"". Insert a new sub-clause as follows: 68.6.2.1 Average optical modulation amplitude (OMA_a) For the purposes of Clause 68, OMA_a is the difference between the mean logic ONE and mean logic ZERO values measured using histograms over the center 0.8 UI of the eye mask. The histograms include the nominal logic level and the maximum or minimum excursions of the mask as illustrated in Figure 68-x. For pre-distorted waveforms OMA_a is usually much larger than OMA_ss and reduction in the reported TWDP is offset by the increase in OMA_a compared to OMA_ss due to pre-distortion. I will send suggested Figure 68-x separately.

Response *Response Status* **O**

Cl **68** *SC* **68.6.2** *P* **17** *L* **40** # **251**

Swenson, Norman ClariPhy Communicati

Comment Type **TR** *Comment Status* **X**

OMA, as it is used in Clause 68, should be the difference between steady state ""on"" power of the transmitter and steady state ""off"" power of the transmitter. The measurement method proposed does not guarantee that this is the value measured, particularly if there is ringing or precompensation.

Suggested Remedy

Change the TWDP algorithm to compute OMA from the measured waveform.

Response *Response Status* **O**

Cl **68** *SC* **68.6.2** *P* **17** *L* **42** # **252**

Thaler, Pat Agilent Technologies

Comment Type **TR** *Comment Status* **X**

Parts of this subclause are confusing. It references 52.9.5 which says the mean is measured using waveform averaging or histogram means but then the second sentence says ""Using histograms...."" What follows would apply equally to histogram or waveform averaging and duplicates what is already in 52.9.5. Is the intent that only histogram averaging is allowed for the purposes of Clause 68 and waveform averaging is disallowed?

Suggested Remedy

Either remove the second sentence ""Using histograms...."" or state clearly that histogram means are required and waveform averaging is not allowed. The latter seems unlikely when no parameters of the histogram measurement (e.g. the number of points that shall be measured) have been stated.

Response *Response Status* **O**

Cl **68** *SC* **68.6.2** *P* **17** *L* **42** # **253**

Grow, Robert Intel

Comment Type **E** *Comment Status* **X**

OMS is actually defined in 1.4.242, does 52.9.5 redefine it? Or do you mean something other than defined.

Suggested Remedy

Either change reference or language.

Response *Response Status* **O**

Cl **68** *SC* **68.6.2** *P* **17** *L* **43** # **254**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Should be no space before % (unlike other units - see style guide for example).

Suggested Remedy

Remove one space in 68.6.2, six in table 68-3, two in table 68-4, and two in 68.6.9.2.

Response *Response Status* **O**

Cl **68** *SC* **68.6.2** *P* **17** *L* **45** # **255**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

This definition of signal amplitude leads to measurement inconsistencies. Tying down the square wave pattern more precisely would lead to arbitrariness in our measurement. In 802.3ae these didn't matter because OMA was primarily used as an intermediate token in a calculation of something else - an error in OMA cancels itself out by subtraction. For LRM, we need a more precise measure of signal amplitude for TWDP. If we are to consider or allow transmitter pre-emphasis, we need a definition of signal amplitude that represents a pre-emphasised signal fairly. However, we could create a new one for TWDP use and stick with OMA for general use.

Suggested Remedy

The histogram-at-crossing-times method is, I believe, more reproducible for non-equalised signals and fairer for equalised ones, both at TP2. But it may not be very reproducible for pre-emphasised signals, and it's not good at TP3 after a difficult fiber. I don't have a wholly satisfactory remedy at present; this TR may hang around until we have done more work to prove out the TWDP method.

Response *Response Status* **O**

Cl **68** *SC* **68.6.2** *P* **17** *L* **47** # **256**

Dudek, Mike Picolight

Comment Type **T** *Comment Status* **X**

The approximate method of measuring OMA will not work well at TP3 due to the highly distorted eyes

Suggested Remedy

Insert ""At TP2"" between OMA and can. Sentence then reads ""For infomation, OMA at TP2 can be measured approximately....."

Response *Response Status* **O**

Cl **68** SC **68.6.2** P **17** L **47** # **257**

Thaler, Pat Agilent Technologies

Comment Type **TR** *Comment Status* **X**

This sentence is confusing on a number of points. Does ""patterns 1, 2, or 3 and with histograms"" mean approximate measurements can be made 4 means - using pattern 1 pattern 2 pattern 3 histograms? That doesn't make sense because the required method allows using histograms. Or does it mean using one of those 3 patterns combined with a histogram - in that case the ""and"" is unecessary. Is the histogram described here one performed over multiple pulses unlike the one in the first paragraph that is done over a single high or low pulse. That seems to be implied by Figure 52-11. I also don't see anything provided by the ""for information"" since the first paragraph is already clear about the required measurment for the spec, and the ""can be measured approximately"" statement already makes it clear that this isn't a definitive measurement.

Suggested Remedy

""OMA can be measured approximately using patterns 1, 2 or 3 with a histogram over multiple pulses as illustrated in Figure 52-11."" Or delete this altogether as those reading the referenced 52.9.5 will be informed of the approximate measurement there and the business of the standard is to specifiy the required measurements.

Response *Response Status* **O**

Cl **68** SC **68.6.3** P **17** L **50** # **258**

CUNNINGHAM, DAVID AGILENT TECHNOLO

Comment Type **TR** *Comment Status* **X**

The extinction ratio is defined in terms of the steady logic ONE and ZERO power levels. With predistortion there is also an extinction ratio associated with distortion or ringing waveforms. The document should make a distiction between these two extinction ratio's.

Suggested Remedy

Rename 68.6.3 Steady state extinction ratio measurement (ER_ss) Search D2.0 for extinction ratio and replace it with ER_ss. It may also be valuable to define the transient extinction ratio associated with pre-distortion. A graph of launch OMA_a versus average launch power for different transient extinction ratio's (similar to Figure 68-5) would then give a very good indication of how pre-distortion reduces TWDP by increasing OMA_a.

Response *Response Status* **O**

Cl **68** SC **68.6.3** P **18** L **14** # **259**

James, David JGG

Comment Type **E** *Comment Status* **X**

Pseudo-row notation is confusing.

Suggested Remedy

Put this information in separate rows.

Response *Response Status* **O**

Cl **68** SC **68.6.3** P **18** L **36** # **260**

James, David JGG

Comment Type **E** *Comment Status* **X**

Pseudo-row notation is confusing

Suggested Remedy

Put distinct data is separate rows.

Response *Response Status* **O**

Cl **68** SC **68.6.3** P **18** L **43** # **261**

James, David JGG

Comment Type **E** *Comment Status* **X**

Pseudo-row notation is confusing.

Suggested Remedy

Put distinct data is separate rows

Response *Response Status* **O**

Cl **68** SC **68.6.3** P **18** L **45** # **262**

James, David JGG

Comment Type **E** *Comment Status* **X**

Pseudo-row notation is confusing

Suggested Remedy

Put distinct data in separate rows.

Response *Response Status* **O**

Cl **68** SC **68.6.3** P **18** L **48** # **263**
James, David JGG

Comment Type **E** *Comment Status* **X**

The units column has '%' where a comment exist

Suggested Remedy

Delete these typos.

Response *Response Status* **O**

Cl **68** SC **68.6.3** P **18** L **7** # **264**
James, David JGG

Comment Type **E** *Comment Status* **X**

Use standard line widths.

Suggested Remedy

Thin lines on boundary, not thick.

Response *Response Status* **O**

Cl **68** SC **68.6.3** P **19** L **45** # **265**
James, David JGG

Comment Type **E** *Comment Status* **X**

The 'Conditions of receiver jitter tolerance test' row is confusing.

Suggested Remedy

Straddle the columns, or describe better is that is not what was intended.

Response *Response Status* **O**

Cl **68** SC **68.6.4** P **21** L **15** # **266**
James, David JGG

Comment Type **E** *Comment Status* **X**

The figure font is nonstandard.

Suggested Remedy

Use 8-point Arial.

Response *Response Status* **O**

Cl **68** SC **68.6.4** P **21** L **3** # **267**
Thaler, Pat Agilent Technologies

Comment Type **TR** *Comment Status* **X**

Is Figure 68-5 normative? Compliance in the title sounds normative, but the text that references it doesn't make it clear that it is. Also, it isn't mentioned in 68.5.1 transmitter optical specifications and Table 68-3. For example, Table 68-3 allows a transmitter with average launch power of 0 dBm and OMA of -1 dBm, but that appears to be non-compliant according to Figure 68-5. Or is the figure just showing where the parameters are will lie when the extinction ratio and the two launch powers are all in bounds?

Suggested Remedy

If Figure 68-5 is normative, then at a minimum add to 68.5.1 a statement like: In addition, the transmitter's average launch power and launch power at OMA shall fall within the grey region of Figure 68-5. Alternatively, this could be done with a note on the parameters in Table 68-3, but I'd prefer to see requirements in the regular font size rather than the note font size where reasonable. If the figure is just showing informative information, then it isn't clear to me why it is necessary or helpful to include it. If you keep it in, please make its informative nature more clear in the text that references the figure.

Response *Response Status* **O**

Cl **68** SC **68.6.4** P **21** L **34** # **268**
Thompson, Joey Circadiant Sysytems, I

Comment Type **T** *Comment Status* **X**

The vertical and Horizontal limits int the plot (Figure 68-3) are exact, but the diagonal limits (in particular the limit for ER=3.5dB) are approximate and depend on the eye shape. The values in the table 68-3 define the requirement, Figure 68-5 is merely a visual aid.

Suggested Remedy

Change ""illustrates the region"" to ""illustrates the approximate region"".

Response *Response Status* **O**

Cl **68** SC **68.6.4** P **21** L **34** # **269**
James, David JGG

Comment Type **E** *Comment Status* **X**

The figure font is nonstandard.

Suggested Remedy

Use 8-point Arial.

Response *Response Status* **O**

Cl **68** *SC* **68.6.4** *P* **22** *L* **17** # **270**

Bradshaw, Peter Intersil

Comment Type **T** *Comment Status* **X**

In Figure 68-5, the lower right bound of the shaded region is labelled ""Extinction ratio very high (bound)"". This sounds like a value judgement, and would surely not belong in a specification. Either it is too high to be allowed, or it is not disallowed, just unlikely to be acheived, but the note seems inappropriate

Suggested Remedy

Get someone who understands this better than me to fix this!

Response *Response Status* **O**

Cl **68** *SC* **68.6.5** *P* **22** *L* **40** # **271**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

This statement 'The frequency response of the measurement instrument (e.g. oscilloscope) should extend to suitably low frequencies, such as 30 kHz or lower.' is a can of worms. The more I think about what the right high-pass filter frequency for a scope making an eye mask measurement, the more complicated it gets. We would need to sort out what we are trying to do and why, and then run simulations to pin down the number, and discuss the order of the filter... And it's all unnecessary; this sentence was created to address the gross low frequency issues possible in 100BASE-X's 4B/5B code, and the scopes I know of are DC coupled anyway.

Suggested Remedy

Option 1 (my preferred, as it keeps similarity with clause 58 and says nothing wrong): delete ', such as 30 kHz or lower'. Option 2: delete all of 'The frequency response of the measurement instrument (e.g. oscilloscope) should extend to suitably low frequencies, such as 30 kHz or lower. A DC coupled instrument is convenient.'

Response *Response Status* **O**

Cl **68** *SC* **68.6.5** *P* **22** *L* **44** # **272**

Dudek, Mike Picolight

Comment Type **T** *Comment Status* **X**

The Eye diagram as presently specified bears little relationship to the performance of this highly filtered system. Better performance can be achieved with parts that have poorer eye margins.

Suggested Remedy

Alternative 1. Measure the eye diagram with a more filtered optical receiver. Change 7.5Ghz to 5.0GHz. Change Y1 and Y2 in table 68-3 to 0.3 and 0.32 respectively. Alternative 2. Delete the eye test altogether. Delete Eye Mask parameters in Table 68-3 and the footnote c to that table. Also delete section 68.6.5 and figure 68-6

Response *Response Status* **O**

Cl **68** *SC* **68.6.5** *P* **22** *L* **49** # **273**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

The appropriate hit ratio was calculated for a non-equalising link. At some point before the end of the project we should confirm or change it as appropriate for our non-equalising situation. I don't expect that any change would be a big deal in practice, so it's not top priority.

Suggested Remedy

Review the hit ratio; change if appropriate.

Response *Response Status* **O**

Cl **68** *SC* **68.6.5** *P* **22** *L* **53** # **274**

Booth, Brad Intel

Comment Type **E** *Comment Status* **X**

The note is very long.

Suggested Remedy

Move note into its own subclause (68.6.5.1).

Response *Response Status* **O**

Cl **68** *SC* **68.6.5** *P* **22** *L* **7** # **275**

James, David JGG

Comment Type **E** *Comment Status* **X**

The abbreviation is unnecessary.

Suggested Remedy

min ==> minimum

Response *Response Status* **O**

Cl **68** *SC* **68.6.5** *P* **23** *L* **14** # **276**

CUNNINGHAM, DAVID AGILENT TECHNOLO

Comment Type **TR** *Comment Status* **X**

The eye mask of Figure 68-6 with co-ordinates from Table 68-3 was arbitrarily relaxed from that of 10GBASE-LR. No clearly articulated case has been presented that justifies the current co-ordinate selection. The eye mask may need change.

Suggested Remedy

Justify the current co-ordinates or show that another set is required.

Response *Response Status* **O**

Cl **68** *SC* **68.6.5** *P* **23** *L* **35** # **277**

James, David JGG

Comment Type **E** *Comment Status* **X**

The figure font is nonstandard.

Suggested Remedy

Use 8-point Arial.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6** *P* **23** *L* **45** # **278**

CUNNINGHAM, DAVID AGILENT TECHNOLO

Comment Type **TR** *Comment Status* **X**

TWDP as described in 68.6.6 and specified in Table 68-3, page 18, line 30 needs to be recalculated. There are a few reasons for this as follows: 1) For very long DFE equalizers the correctly normalized TWDP can be shown to be: TWDP = PIE_D - 5log(<P(f)/N(f)>g) + 5log(<P(f)/N(f)>a) (in dBo) where PIE_D is per Bhoja_1_0704 for the NRZ reference case, P(f) is the power spectrum of pre-distorted NRZ with random data, N(f) is the power spectrum of the reference NRZ with random data, < >g represents the geometric mean and < >a represents the arithmetic mean. To get the equation for TWDP in this form I have used an approximation by using PIE_D as the first term - but this a very good approximation and does not affect my argument. The current method of calculating TWDP does not properly account for the last term in this equation. The last term represents the increased transmit power for the waveform under test relative to the NRZ reference waveform. When this term is taken into account it becomes clear that TWDP is approximately constant and equal to PIE_D independent of the waveform. However, non-symmetric pre-distortion is generally damaging as it introduces a line spectrum that can be associated with wasted un-equalised power and jitter. 2) The channels used for estimating TWDP are not yet agreed within 10GBASE-LRM and are expected to change.

Suggested Remedy

Correct the TWDP method so that it properly normalises the transmit power for waveforms under test relative to the NRZ reference. My comment on making the OMA a more fair representation is relevant to this issue. If that is accepted then I believe it will fix this issue too. Track the agreed test channels within 10GBASE-LRM and calculate TWDP with the most current channels.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6** *P* **23** *L* **47** # **279**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

As Intel have shown, there might be transmitter defects that are not caught by our suite of eye mask, TWDP, SNR and random jitter. This is another comment that will have to stay open 'just in case'.

Suggested Remedy

If there are likely and serious defects not screened for, decide what to do; e.g. give a warning, do nothing, modify a test, add a new test.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6** *P* **23** *L* **51** # **280**

CUNNINGHAM, DAVID AGILENT TECHNOLO

Comment Type **TR** *Comment Status* **X**

There is no need to have multiple emulated fibers included within the TWDP method and algorithm. It may even be possible to delete the channel altogether. This is because per a previous comment TWDP is given by :
TWDP = PIE_D - 5log(<P(f)/N(f)>g) + 5log(<P(f)/N(f)>a) (in dBo) The component of TWDP that is channel dependent is PIE_D for the reference NRZ signal. PIE_D can be viewed as a maximum value consistent with the 10GBASE-LRM power budget. Whilst it is true that for a given maximum PIE_D value there are many channels, to a very long equalizer, these are equivalent channels. Therefore, there is no need to calculate PIE_D for each (any?) channel; it is by definition PIE_D.

Suggested Remedy

Choose one channel, with PIE_D set to an agreed maximum value, for the TWDP method.
On page 23, line 52, replace ""fibers"" with ""fiber"".
On page 24, line 4, in Figure 68-7 replace ""channels"" with ""channel"".
On page 24, line 23, replace ""each of three emulated channels, equivalent to those given in Table 68-4 for the comprehensive stressed receiver specifications"" with ""a channel""
On page 24, line 25, delete "" The TWDP measurement is the largest of the three penalty results.""
On page 24, delete the three fiber responses in lines 52-54.
On page 25, replace line 1 by the currently agreed fiber response (this may change throughout the development of the specification).
On page 25, replace line 18 with ""for i=1""

Response *Response Status* **O**

Cl **68** *SC* **68.6.6** *P* **23** *L* **51** # **281**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

I'm not convinced that TWDP needs to include a set of emulated fibers; they may skew the test towards transmitters that perform relatively well with these specific cases, rather than well over a wide range of fibers. And if we can do without the emulated fibers, things get a bit simpler.

Suggested Remedy

Investigate whether TWDP really needs or benefits from the set of emulated fibers. If not, rename it 'TWP', change 'with standard emulated multimode fibers and receiver' to 'with a standard receiver'. Change 68.6.6.1 p 24 line 22 'This algorithm analyses the waveform in combination with each of three emulated channels, equivalent to those given in Table 68-4 for the comprehensive stressed receiver specifications, and with an emulated reference receiver equalizer.' to 'This algorithm analyses the waveform with an emulated reference receiver equalizer.'. Delete this sentence: 'The TWDP measurement is the largest of the three penalty results.' Change the algorithm (p 24 lines 48-54, p25 lines 1 2 18-24 p26 lines 23-25) and Annex 68A to match.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6** *P* **24** *L* **6** # **282**

James, David JGG

Comment Type **E** *Comment Status* **X**

Excess capitalization

Suggested Remedy

System Under Test ==> System under test

Response *Response Status* **O**

Cl **68** *SC* **68.6.6** *P* **24** *L* **7** # **283**

James, David JGG

Comment Type **E** *Comment Status* **X**

The figure font is nonstandard.

Suggested Remedy

Use 8-point Arial.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.1** *P* **24** *L* **14** # **284**

CUNNINGHAM, DAVID AGILENT TECHNOLO

Comment Type **TR** *Comment Status* **X**

It is not clear that TWDP is required. It complicates the document.

Suggested Remedy

Do a global search for TWDP and delete all references, text, code and descriptions associated with TWDP from the document. Or, make it clear exactly what TWDP is, how it should be interpreted and why it is valuable as a specification in its own right.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.1** *P* **24** *L* **18** # **285**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

We need to give the reader the information needed to get from a captured waveform at e.g. 7 samples/UI to a processable one. How is the interpolation to be done? Is an oversampling rate of 16 a requirement? Would 8 work? Would 32 be better? Would an odd number work? (I believe not). How is the alignment done? We'll try to bring partial information on these subject to the meeting. I expect we will be able then to start writing text along the lines of 'Measurement at 7 samples/UI would give a measurement-related error about x dB (sign?), 8 or 10 samples/UI would... Interpolation methods Y and Z may have consequences A and B. A timestep of 1/c UI for the calculation is OK/bad; an even number of c is required.' Notice that there's an alignment in 40.6.1.2.4.

Suggested Remedy

Remove the sentence at line 18 'effective sample rate of at least 7 samples per unit interval is required.', insert a new paragraph (to be written) at line 27.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.1** *P* **24** *L* **18** # **286**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Confusion around 'stored' and 'recorded'. If a waveform is held in RAM then thrown away when the TWDP has been calculated, is it 'stored'? Confusion with sentences like 'Record the serial number of the oscilloscope', 'record the test pattern used'.

Suggested Remedy

Line 18, delete 'and stored'. Line 20, change 'recorded' to 'captured' (twice). Line 22, change 'stored' to 'captured'.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.1** *P* **24** *L* **21** # **287**

Lindsay, Tom ClariPhy Communicati

Comment Type **T** *Comment Status* **X**

We have discussed interpolation methods on the TP2 calls and how erroneous results are possible with linear interpolation. Guidance is appropriate.

Suggested Remedy

Insert a new paragraph: ""The algorithm assumes 16 samples per unit interval. If the waveform was not originally captured with 16 samples per unit interval, then interpolation will be required. If interpolation is required, then sin(x)/x or cubic spline methods should be used. Linear interpolation may not be sufficiently accurate.""

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.1** *P* **24** *L* **25** # **288**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Distracting sentence 'The reference equalizer is equivalent to an infinite length decision feedback equalizer.' Trying to decide what 'equivalent to an infinite length' means is a diversion. Remember the applied mathematicians' 'light inextensible string', 'smooth inclined plane' and so on - they don't say 'infinitely light/smooth/...'. I agree with the authors that there are enough taps that the number doesn't matter.

Suggested Remedy

Change to 'The reference equalizer is a long decision feedback equalizer with many taps.' Can anyone come up with smoother phrasing?

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.2** *P* **24** *L* **27** # **289**

CUNNINGHAM, DAVID AGILENT TECHNOLO

Comment Type **T** *Comment Status* **X**

Normally in IEEE 802.3 documents normative algorithms are written in a non-proprietary pseudo-code or mathematics. This allows users to develop their own compliant independent implementations of the algorithm. I realise that there have been a few exceptions to this. However, I don't agree that the exceptions are a good practise to follow.

Suggested Remedy

Re-write the TWDP algorithm in mathematics or pseudo-code. If pseudo-code is used explain the syntax in an annex. Optionally, provide the MATLAB code as an example algorithm in an informative annex. The simplest edit that would start this process would be to exchange the contents of 68.6.6.2 and annex 68A.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.2** *P* **24** *L* **28** # **290**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Need to find out if we will need a copyright release statemnet for the code and whether we want to put it on the web (by iteslf). See 40.6.1.2.4 for precedent.

Suggested Remedy

Find out.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.2** *P* **24** *L* **30** # **291**

Bradshaw, Peter Intersil

Comment Type **ER** *Comment Status* **X**

I cannot find any examples of MATLAB code in the other portions of the 802.3 spec. Also, I cannot find any reference to a Toeplitz matrix in the current spec, and I have not seen any in my local supermarket. The description of the algorithm in the main body of Clause 68 seems too samll, at least some outline should be presented there.

Suggested Remedy

Move the MATLAB code to annex 68A, or a new annex (68B?), and put at least a short description of the algorithm in place of this section. And insert a definition of a ""Toeplitz matrix"", or a reference to a readily accessible source.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.2** *P* **24** *L* **30** # **292**

Lindsay, Tom ClariPhy Communicati

Comment Type **ER** *Comment Status* **X**

The MATLAB TWDP code was initially written for folks to test and become familiar with it. It should now be adapted to better fit the standard. This comment addresses formatting, eliminates reference to an improper data sequence, eliminates reference to a specific waveform, corrects some variable names, and gives better guidance to the user. This is essentially a resubmission of comment 96 from the previous ballot (except for a few items that were addressed in Atlanta). I considering breaking this into pieces, but since it's already prepared this way, has been out long enough for folks to review, is tested, and is editorial (does not affect technical results in any way), I decided to submit it as a block this one time.

Suggested Remedy

See separate document ""TWDPforD2_0.txt"". This is readily viewed in Notepad - I used an 8 point Courier font to view. Editor - please use a fixed pitch font in the standard, as it will greatly improve readability. You may have to work with tabs to maintain the structured appearance.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.2** *P* **24** *L* **30** # **293**

Swenson, Norman ClariPhy Communicati

Comment Type **TR** *Comment Status* **X**

The TWDP algorithm scales the OMA of the measured waveform to 1 and sets the noise spectral density accordingly. A matched filter bound for a rectangular pulse with OMA 1 is used as a reference point for determining TWDP. This penalizes waveforms with larger OMAs and less predistortion in a manner that does not accurately predict link performance.

Suggested Remedy

Change the TWDP algorithm to accurately measure the matched filter bound of the transmitted waveform and compare that to the effective SNR at the slicer of the reference equalizer. Define limits that will ensure link closure with a compliant channel and receiver.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.2** *P* **24** *L* **32** # **294**

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **X**

The comments in this code need updating at several points; I expect Tom will provide comments.

Suggested Remedy

Edit and revise the comments to keep in step with the rest of the draft.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.2** *P* **24** *L* **38** # **295**

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **X**

Need to show that the input pattern is an example, and make the example the preferred choice. The PRBS9 is on the web at http://ieee802.org/3/aq/public/tools/TWDP/prbs9_950.txt (the 950 is shorthand for its polynomial). In the following, some quotes are mine, others are part of the draft.

Suggested Remedy

Change ''TxData.txt';' to ''prbs9_950.txt'; % This is an example'. Similarly, comment MeasuredWaveformFile MeasuredOMA SteadyZeroPower and (I think - see other comments) OverSampleRate, to show they are examples. Change 'G05.txt' to an example that's compatible with prbs9_950.txt.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.2** *P* **24** *L* **40** # **296**

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **X**

Terminology: 'bit period', 'bit time', 'unit interval' (see 1.4 Definitions).

Suggested Remedy

Change 'bit period' to 'unit interval', here and several times in 68A.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.2** *P* **24** *L* **42** # **297**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

re 'OMA and steady-state ZERO power must also be specified.': I don't think this is viable as it stands. The assumed steady-state ZERO power matters remarkably little but the assumed OMA is too important.

Suggested Remedy

Make the program calculate the things it needs, or at least explain clearly how they can be found with adequate accuracy. OMA may not be the right (robust, accurate, fair) metric.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.2** *P* **24** *L* **47** # **298**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

Is an oversampling rate of 16 a requirement?

Suggested Remedy

Decide and make clear.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.2** *P* **24** *L* **52** # **299**

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **X**

It's a nuisance that the test cases are arranged in columns here while they are in rows in table 68-4.

Suggested Remedy

FiberResp = [...
0.000000 0.072727 0.145455 0.218182
a b c d
e f g h
I j k l];
Delays = FiberResp(1,:); need to check if that should be FiberResp(1,:)';
(in STEP 1)
Pcoefs = FiberResp(i+1,:); need to check if that should be FiberResp(i+1,:)';

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.2** *P* **24** *L* **52** # **300**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

The emulated fiber tap weights are wrong.

Suggested Remedy

Revise them following table 68-4.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.2** *P* **25** *L* **23** # **301**

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **X**

This construct Hsys(find(Fgrid==0)) was new to me; other programming languages may not have an equivalent, and we are trying to make our algorithm portable to other languages.

Suggested Remedy

Change abs(Hsys(find(Fgrid==0))) to sum(PCoefs)

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.2** *P* **25** *L* **29** # **302**

CUNNINGHAM, DAVID AGILENT TECHNOLO

Comment Type **TR** *Comment Status* **X**

The section of the MATLAB code that is used to compute the frequency response of the front-end Butterworth filter is not written in terms of basic MATLAB functions: [b,a] = butter(4, 2*pi*EFilterBW,'s'); H_r = freqs(b,a,2*pi*Fgrid); are signal processing toolbox functions.

Suggested Remedy

Re-write these functions with basic MATLAB functions without the need for the signal processing toolbox.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.2** *P* **25** *L* **29** # **303**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

The functions butter and freqs are toolbox functions (extra cost, probably not readily portable). As the details of the anti-aliasing filter are not supposed to matter, can we replace this with something simpler? It's easy to avoid butter, if one knows that a = 1 123.14 7581.8 273450 4931300 and b = 0 0 0 0 4931300. Not sure how to get rid of freqs. Can we just write down a filter in a form like 1+cos(f/f0)^4 ?

Suggested Remedy

Replace toolbox functions with 'plain vanilla' code, changing the filter type if it helps.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.2** *P* **25** *L* **41** # **304**

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **X**

E not defined

Suggested Remedy

Tell us what E is.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.2** *P* **25** *L* **41** # **305**

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **X**

|| not defined

Suggested Remedy

Tell us what || means.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.2** *P* **25** *L* **42** # **306**

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **X**

Mention of 'the expectation operator' but no instance of it in the clause.

Suggested Remedy

Tell us where we are supposed to see this expectation operator. e.g. if it is E, say so.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.2** *P* **25** *L* **43** # **307**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Description of step 5 and comments describing smaller steps have become merged. Comment not near its subject.

Suggested Remedy

Start a new line after 'Z.' (the end of the description of step 5). Move the line '%% Constuct a Toeplitz autocorrelation matrix.' to just before 'C = toeplitz(Corr(1:EqNf));'.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.2** *P* **25** *L* **44** # **308**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Spelling

Suggested Remedy

Change 'Constuct' to 'Construct'.

Response *Response Status* **O**

Cl **68** *SC* **68.6.6.2** *P* **26** *L* **25** # **309**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Save a line (sorry, should have thought of it last time!)

Suggested Remedy

Join two lines, giving:TWDP = max(TrialTWDP) % End of program

Response *Response Status* **O**

Cl **68** *SC* **68.6.7** *P* **26** *L* **31** # **310**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Readers may not associate RINxOMA with RIN12OMA.

Suggested Remedy

insert extra words: '...specification given in Table 68-3 as RIN12OMA, when measured...'. 12 is subscript.

Response *Response Status* **O**

Cl **68** *SC* **68.6.7** *P* **26** *L* **31** # **311**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Format

Suggested Remedy

In RINxOMA, make the x a subscript.

Response *Response Status* **O**

Cl **68** *SC* **68.6.7** *P* **26** *L* **32** # **312**

Dudek, Mike Picolight

Comment Type **T** *Comment Status* **X**

The Transmitter signal to noise ratio (RIN) test is appropriate for a single mode system not a multimode system. The 12dB reflector should be placed in the multimode system without a polarization rotator.

Suggested Remedy

Page 26 Line 32. Change 'Given in 58.7.7"" to ""given in 58.7.7 except that the single mode fiber between the DUT and the reflection should be replaced with a multimode fiber of at least 2meters in length, and the polarization rotator should be removed"". Page 26 line 42. Delete the sentence ""The polarization rotator is etc."" Figure 68-8. Remove the polarization rotator and change ""single mode fiber"" to ""multimode fiber"". Page 27 line 30. delete reference to polarizer ""without polarizer and back-reflection"" to ""without back-reflection""

Response *Response Status* **O**

Cl **68** *SC* **68.6.7** *P* **26** *L* **36** # **313**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

The text says 'The length of the test cable is not critical, but should be in excess of 2 m.' Figure 68-8 does not show a 'test cable'. IF we go to an MMF-based measurement, can a regular MMF patch cord (2 to 5 m long) be used? If so, let's use it, and mention TP2. Should it be deliberately wound or straightened to influence modal distribution? I believe a regular patch cord is more relevant than an offset-launch patch cord. Which size of MMF to use, 62.5/125, 50/125, or (I hope not!) each in turn?

Suggested Remedy

Clean up the terminology, make sure item can be identified in figure 68-8, give guidance on type and use of item.

Response *Response Status* **O**

Cl **68** *SC* **68.6.7** *P* **26** *L* **40** # **314**

Thaler, Pat — Agilent Technologies

Comment Type **TR** *Comment Status* **X**

""with an optical return loss specified in Table 68-3"" might be misunderstood. Table 68-3 has a line for optical return loss that requires 12 dB min. A very high return loss such as 40 dB would meet the return loss spec in Table 68-3. Since Table 68-3 is specifying RIN12OMA, I assume the intent here is that the return loss for the test be close to the worst case return loss of 12 dB.

Suggested Remedy

Make it clear that the return loss is 12 dB. For example, state 12 dB return loss here or make it clear that it is the 12 in RIN12OMA that is the return loss specification or state that the return loss for the test is the minimum return loss specified in Table 68-3.

Response *Response Status* **O**

Cl **68** *SC* **68.6.7** *P* **26** *L* **41** # **315**

Dawe, Piers — Agilent

Comment Type **TR** *Comment Status* **X**

We agreed at the last meeting that the RIN procedure does not properly represent the reflections likely with multimode fiber. One way to address this is to use a multimode-fiber test rig, although my colleagues are not convinced that it would be reproducible. If so, I understand we should remove the polarization rotator. But I'm not sure how this works. How much MMF do you need to get a mix of polarisations? Do we need to specify a long (>>2 m) fibre or some kind of twisting of it? Even if you do get a mix, each mode has only one polarisation state, and if only a very few are coupled into the laser, will the experiment be reproducible enough? Anyway, I suspect that a fiber manipulator ('mouse ears') should still be used, even with MMF. Does the fiber manipulator have a proper name?

Suggested Remedy

If we still need a fiber manipulator, Change to 'The fiber manipulator is used to explore diffrent phasings of the guided modes in a fiber, and should be adjusted to maximize the noise.' and in figure 68-8, change 'Polarization rotator' to 'Fiber manipulator'. If we can satisfy ourselves that we can get reproducible enough results without any kind of fiber manipulator or polarization rotator, then delete the sentence 'The polarization rotator is ... noise.' and in figure 68-8, delete the words 'Polarization rotator'. The loops can then represent the test cable or patch cord. In either case, change 'Single-mode fiber' to test cable or patch cord or whatever. Delete or change 'polarizer and' from 68.6.8. If this method doesn't work reproducibly, stay with SMF and reduce the back reflection per my comment 45 against D1.1 (also considering the NAs of compliant module launches vs. SMF as a small correction factor).

Response *Response Status* **O**

Cl **68** *SC* **68.6.7** *P* **26** *L* **43** # **316**

Dawe, Piers — Agilent

Comment Type **T** *Comment Status* **X**

There's nothing here about how to set the back reflection.

Suggested Remedy

Insert new sentence 'The variable reflector is set to provide a reflection of -x dB (x dB of return loss) as seen by the system under test.' or (see another comment) 'The reflector provides a reflection of -x dB (x dB of return loss) as seen by the system under test.'

Response *Response Status* **O**

Cl **68** *SC* **68.6.7** *P* **26** *L* **48** # **317**

James, David — JGG

Comment Type **E** *Comment Status* **X**

The equation is confusing

Suggested Remedy

1) Replace English fragment with a real variable. 2) Define the variable after the equation.

Response *Response Status* **O**

Cl **68** *SC* **68.6.7** *P* **26** *L* **54** # **318**

Dawe, Piers — Agilent

Comment Type **TR** *Comment Status* **X**

I suspect that in equations 68-3 and 68-4 we may have ignored the difference between noise bandwidth and signal bandwidth, or the RIN k factor.

Suggested Remedy

Review and correct the equations and p27 lines 1-3 as necessary. Change BW to NBW if appropriate.

Response *Response Status* **O**

Cl **68** *SC* **68.6.7** *P* **26** *L* **54** # **319**

Dudek, Mike — Picolight

Comment Type **E** *Comment Status* **X**

The correct units for RIN is dB/Hz

Suggested Remedy

Change dB to dB/Hz

Response *Response Status* **O**

Cl **68** *SC* **68.6.7** *P* **26** *L* **55** # **320**

James, David JGG

Comment Type **E** *Comment Status* **X**

Wrong symbol.

Suggested Remedy

Replace the multiply dot with an x, as per Style Manual preferences.

Response *Response Status* **O**

Cl **68** *SC* **68.6.7** *P* **27** *L* **14** # **321**

Dawe, Piers Agilent

Comment Type **T** *Comment Status* **X**

No reason why the variable reflector should be variable - could be set by the manufacturer or calibration house

Suggested Remedy

Delete 'variable'

Response *Response Status* **O**

Cl **68** *SC* **68.6.7** *P* **27** *L* **2** # **322**

Dawe, Piers Agilent

Comment Type **T** *Comment Status* **X**

re 'DC blocking capacitor, if any'; is this too vague? Is 1/f or PSU noise an issue?

Suggested Remedy

If it's worth being more precise, insert new sentence 'If low frequency noise is a concern, a 1 MHz first order high pass filter is recommended.'

Response *Response Status* **O**

Cl **68** *SC* **68.6.7** *P* **27** *L* **2** # **323**

Lindsay, Tom ClariPhy Communicati

Comment Type **T** *Comment Status* **X**

RIN/SNR test for TP2 should provide more guidance on the low frequency corner and the noise bandwidth.

Suggested Remedy

1. Change to ""... due to the DC blocking capacitor. DC blocking may not be possible in some equipment, but it is recommended to represent the beneficial effects of AC coupling in receivers to reduce the effects of 1/f noise or low frequency power supply noise. The recommended 3 dB low corner frequency is 300 kHz, but up to 1 MHz is allowed (note, this range is also recommended for the method in clause 58.7.7). The white noise bandwidth upper corner frequency for the 4th-order Bessel Thomson filter is approximately 7.85 GHz. Therefore for the recommended measurement setup, the white noise bandwidth, NBW, is approximately 7.5 GHz."" 2. Change BW to NBW throughout this subclause (3 places).

Response *Response Status* **O**

Cl **68** *SC* **68.6.7** *P* **27** *L* **7** # **324**

James, David JGG

Comment Type **E** *Comment Status* **X**

The figure font is nonstandard.

Suggested Remedy

Use 8-point Arial.

Response *Response Status* **O**

Cl **68** *SC* **68.6.8** *P* **27** *L* **29** # **325**

Dawe, Piers Agilent

Comment Type **T** *Comment Status* **X**

This sentence 'The uncorrelated jitter specification of Table 68-3 shall be met when measured using a measurement setup as that used for the transmitter signal to noise measurement, but without polarizer and back-reflection elements.' becomes more troublesome if the alternative RIN test goes to MMF, because I don't think the choice of fiber will have any effect on the jitter, and for many people with SMF-oriented scope heads, they would prefer to use them.

Suggested Remedy

Start again with a new figure, simplify the text to explain afresh.

Response *Response Status* **O**

Cl **68** *SC* **68.6.8** *P* **27** *L* **31** # **326**

Dawe, Piers — Agilent

Comment Type **T** *Comment Status* **X**

re 'A test pattern is used, as specified in Table 68-5.'; for the reader who expects a test pattern to be used, this sentence doesn't read too well.

Suggested Remedy

Change to 'The test pattern to be used is specified in Table 68-5.'

Response *Response Status* **O**

Cl **68** *SC* **68.6.8** *P* **27** *L* **37** # **327**

Thaler, Pat — Agilent Technologies

Comment Type **E** *Comment Status* **X**

The text says average power level but the figure labels it mean power level. Okay, this is a terribly picky point but why use two different words for the same thing?

Suggested Remedy

Replace ""average"" with ""mean""

Response *Response Status* **O**

Cl **68** *SC* **68.6.8** *P* **27** *L* **37** # **328**

Dawe, Piers — Agilent

Comment Type **T** *Comment Status* **X**

Do we need to say more about which edge? The following remedy is rather tentative and may not be necessary; lab reports on this subject would help.

Suggested Remedy

At end of paragraph, add new sentences 'If the measured jitter is near to the specification limit, it may be appropriate to consider the root sum of squares of many edges. Rising edges may have more jitter than falling edges.'

Response *Response Status* **O**

Cl **68** *SC* **68.6.8** *P* **27** *L* **45** # **329**

James, David — JGG

Comment Type **E** *Comment Status* **X**

The figure font is nonstandard.

Suggested Remedy

Use 8-point Arial.

Response *Response Status* **O**

Cl **68** *SC* **68.6.8.3** *P* **29** *L* **16** # **330**

Thaler, Pat — Agilent Technologies

Comment Type **ER** *Comment Status* **X**

The reference to Figure 68-12 seems misplaced here. It should be given in 68.6.8.2 (about line 34 of page 29 seems best) where the pulses are originally defined. As it is, it isn't clear that these are the same pulses.

Suggested Remedy

Delete the paragraph beginning ""Figure 68-12 shows ..."" and add to 68.6.8.2 ""Figure 68-12 illustrates the three signal shapes.""

Response *Response Status* **O**

Cl **68** *SC* **68.6.9** *P* **28** *L* **5** # **331**

Dawe, Piers — Agilent

Comment Type **E** *Comment Status* **X**

Distracting bad English in '68.6.9.1 through 68.6.9.4'

Suggested Remedy

Change 'through' to 'to'.

Response *Response Status* **O**

Cl **68** SC **68.6.9** P **29** L # **332**

Weiner, Nick Phyworks

Comment Type **T** *Comment Status* **X**

Document gives both reference components of 68.6.9.2 and resulting test channel responses of 68.6.8.3, as normative. These should be equivalent, for the given measurement method - i.e. when using an optical receiver with 7.5GHz, fouth order BT response. Only one should be normative. I suggest that we keep the reference components as normative, and give the resulting test channel responses, as measurement using the suggested instrumentation, as informative.

Suggested Remedy

Change 68.6.9 Page 28, line 4: Change ""These parameters are defined with reference to the procedures of 68.6.9.1 through 68.6.9.4."" to ""These parameters are defined with reference to 68.6.9.1, 68.6.9.2 and 68.6.9.4."" Change 68.6.9.3 Title: 68.6.9.3 Comprehensive stressed receiver test signal calibration - informative Page 29, line 42: The test signal may be calibrated ...

Response *Response Status* **O**

Cl **68** SC **68.6.9.1** P **28** L **11** # **333**

Kolesar, Paul Systimax

Comment Type **TR** *Comment Status* **X**

The comprehensive stressed receiver sensitivity test insufficiently tests the capability of the receiver. Experimental reports from more than one laboratory (e.g. Balemarthy_1_0105) have shown that waveform changes induced by variations in singlemode polarization state cause variations up to 2.5 dB in PIE-D. The ability of the receiver to track such changes is untested, although the ability to support such waveform changes is required in clause 68.5.2. While arguments have been put forth that these waveform variations happen at speeds well below the feedback loop time constants of EDC chips, there are other aspects besides speed of adjustment that determine the ability of the equalizer to faithfully track such changes without inducing bit errors. For examples, the chips ability to hold accurate clock recovery, correctly adjust its coefficients (tracking accuracy), and have sufficient headroom in its adjustment range are not established only by the speed of its feedback loop. These aspects can be checked in aggregate by a test that induces variation in the received waveform that emulate changes induced by mechanical perturbation observed experimentally.

Suggested Remedy

Add a dynamic aspect to the comprehensive stressed receiver sensitivity test. One means of accomplishing this would be to vary the tap weights of the ISI generator of figure 68-10 to emulate experimentally captured waveform changes induced by polarization state variations or multimode fiber shaking. This approach has the advantage of leveraging the measurement configuration of the existing test. The frequency of the variation should be at least 10 Hz, and the amplitude of the tap weight changes within a full cycle should be sufficient to cause an increase of 2.5 dB in PIE-D relative to the three presently defined comprehensive stressed receiver test signals of table 68-6. A possible alternative approach, if it can be shown to impart similar rigor, would be to continuously vary the test signals from the defined pre-cursor to split symmetrical to post-cursor conditions (and back again) at a rate of at least 10 Hz during the comprehensive stressed receive test.

Response *Response Status* **O**

Cl **68** SC **68.6.9.1** P **28** L **11** # **334**

Mei, Richard SYSTIMAX Solutions

Comment Type **TR** *Comment Status* **X**

The current test methodology for the receiver does not adequately address the dynamic variations in the channel. The ability of the receiver to track such changes is untested.

Suggested Remedy

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.1** *P* **28** *L* **13** # **335**

Thompson, Joey Circadiant Sysytems, I

Comment Type **T** *Comment Status* **X**

Figure 68-10 is a conceptual block diagram. The goal is to have a real-world result that approaches the concept.

Suggested Remedy

Replace ""the block diagram"" by ""the conceptual block diagram"".

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.1** *P* **28** *L* **16** # **336**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

Should mention that the Gaussian noise starts out as white noise. Also, inconsistent terminology: bullet a has Gaussian noise interferer, figure 68-10 has Gaussian noise generator.

Suggested Remedy

Change both to 'Gaussian white noise source'

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.1** *P* **28** *L* **16** # **337**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

How far down the skirts does the distribution of Gaussian noise have to extend?

Suggested Remedy

Find out! If it's important and a surprising answer, we may have to break our rule of purity and simplicity, and state it (later in 68.6.9 at p29 line 29). I expect that it won't be important - this is a 'just in case' comment.

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.1** *P* **28** *L* **18** # **338**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

'Intersymbol interference (ISI)' and its sort of synonym in lines 28 and 33 and figure 68-10 'ISI generator' are too imprecise to specify what we mean. The item in question thing is a transversal filter. (Does anyone have another precise but implementation-neutral sugegstion for a name?) 'Transversal filter' is not an implementation; the reader is at liberty to choose how he would like to implement his transversal filter (as a tapped delay line in the example we give, or power splitter and different length coax, or other...), or to emulate it with something else. The style guide clause 12 says 'The same term shall be used throughout each standard or series of standards to designate a given concept. The use of an alternative term (synonym) for a concept already defined shall be avoided.' See 52.9.10.3 for precedent of a transversal filter.

Suggested Remedy

Change 'intersymbol interference (ISI)' and 'ISI generator' to 'transversal filter' (9 times).

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.1** *P* **28** *L* **18** # **339**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

We are describing the precise signal generator made of ideal components first. There's no 'as needed' about it. Terminology needs tightening up.

Suggested Remedy

Change 'additional low pass filtering, as needed, to achieve the required Gaussian pulse response specified in 68.6.9.2.' to 'Gaussian low pass filter'. In line 33 and figure 68-10, change 'Pulse-shaping filter' to 'Gaussian low pass filter'. In 68.6.9.3, consider changing 'Gaussian filter' to 'Gaussian low pass filter'.

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.1** *P* **28** *L* **23** # **340**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Consistency of terminology

Suggested Remedy

Use hyphen between mode and conditioning, here, in figure 68-10, in 68.6.10, in figure 68-13, in 68.6.11, and in figure 68-14.

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.1** *P* **28** *L* **25** # **341**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Editorials

Suggested Remedy

Correct font size of 'or 59.9.5', remove second space between 125 and um. Should it be 62.5 rather than 62?

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.1** *P* **28** *L* **25** # **342**

Booth, Brad Intel

Comment Type **ER** *Comment Status* **X**

Label for the fiber is incorrect.

Suggested Remedy

Change to read: 62.5/125 um fiber

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.1** *P* **28** *L* **2632** # **343**

Thompson, Joey Circadiant Sysytems, I

Comment Type **T** *Comment Status* **X**

To clarify the test.

Suggested Remedy

Replace the paragraph and following note with the following text: ""The characteristics of the stressed test signal are defiend in 68.6.9.2 and are based upon the parameters in Table 68-4. These parameters and the definition in 68.6.9.2 are meant to suggest an implementation for the ISI generator as a tapped delay line with four weighted taps, having equally spaced delays and with an impulse response as shown in the conceptual illustration in Figure 68-11. Note that other implementations may be used provided that the resulting signal and noise in the optical domain match the requirements given in section 68.6.9.2 and Table 68-4 and provided that the Gaussian noise is shaped by the ISI generator and by the optional shaping filter.""

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.1** *P* **28** *L* **31** # **344**

Dawe, Piers Agilent

Comment Type **T** *Comment Status* **X**

I wonder if instead of saying 'the implementation shown in Figure 68-10' we should

Suggested Remedy

change to 'the implementation defined here'

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.1** *P* **28** *L* **31** # **345**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

This NOTE allowing alternative implementations is very important, to allow test equipment makers to do their work - at present as an informative note it isn't part of the standard. We need to give it effect.

Suggested Remedy

Turn the paragraph into regular text, remove 'NOTE - '.

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.1** *P* **28** *L* **31** # **346**

king, jonathan BBN

Comment Type **TR** *Comment Status* **X**

The note referring to other implementations of the ISI generator should give a clear definition of what 'match' means for alternative implementations of the ISI generator. The degree of matching need not be specified (but is desirable) , but a test for ensuring adequate matching should be described. The TWDP test is a good candidate for this; The TWDP value for the ISI generator should be equal to the max TWDP value in table 68-3

Suggested Remedy

Add a recommendation in the Note (line 31) that a TWDP test process be performed on the ISI generator, referencing the technique described in 68.6.6, and the max TWDP value described in table 68-3

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.1** *P* **28** *L* **41** # **347**

James, David JGG

Comment Type **E** *Comment Status* **X**

The figure font is nonstandard.

Suggested Remedy

Use 8-point Arial.

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.1** *P* **28** *L* **42** # **348**

Dudek, Mike Picolight

Comment Type **T** *Comment Status* **X**

The Pulse-shaping in fig 68-10 is compensating for two items. The fact that the Pattern Generator does not have a 47ps risetime output, and the fact that the E/O convertor isn't perfectly flat. Unfortunately the noise spectral density of the Gaussian noise generator will be affected by this filter and the portion of the compensation for the Pattern Generator's risetime will cause differences in measurement results from one test system to another. I expect that the Pattern Generator's risetime will be the dominant reason that the pulse shaping filter is needed.

Suggested Remedy

Option 1 In Fig 68-10 Move the Pulse Shaping filter from it's present position to between the pattern generator and the summing junction. Option 2. If the committee feels that the E/O convertors bandwidth is a significant additional variable. In Fig 68-10 add an additional pulse shaping filter 1 between the pattern generator and the summing junction. Insert a sentence at the beginning of section 68.6.9.3. The Pulse shaping filter 1 should approximate a 4th order Bessel Thompson filter response and it's bandwidth should be adjusted such that the risetime at it's output is 47ps +/-1ps.

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.1** *P* **28** *L* **43** # **349**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

Have we got our components in the right order?

Suggested Remedy

When we have understood our noise bandwidths, if appropriate, put the Gaussian low pass filter (currently shown as 'Pulse-shaping filter') between the pattern generator and the summing point. May need to adjust noise definitions and even the stressors as a consequence.

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.1** *P* **29** *L* **4** # **350**

Lindsay, Tom ClariPhy Communicati

Comment Type **T** *Comment Status* **X**

The A-subscript index ranges from 0-3 in Eq 68-5 and Eq 68-6, yet Figure 68-11 and Table 68-4 show 1-4. The ranges should match. The figure and table would be the easiest and most clear to change.

Suggested Remedy

Change the A-subscripts in Figure 68-11 from 1-4 to 0-3. Change the A-subscripts in Table 68-4, lines ~ 31-35 from 1-4 to 0-3. I am not aware of other instances.

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.1** *P* **29** *L* **6** # **351**

James, David JGG

Comment Type **E** *Comment Status* **X**

The figure font is nonstandard.

Suggested Remedy

Use 8-point Arial.

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.2** *P* **29** *L* **22** # **352**

Booth, Brad Intel

Comment Type **E** *Comment Status* **X**

The ""Where..."" statement doesn't appear to be the correct format.

Suggested Remedy

Change to the correct format.

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.2** *P* **29** *L* **22** # **353**

Petre Popescu

Comment Type **T** *Comment Status* **X**

Comment: PRBS9 is too short for comprehensive stressed receiver test.

SuggestedRemedy: S(t) is an ideal NRZ test pattern PRBS31

Suggested Remedy

SuggestedRemedy: S(t) is an ideal NRZ test pattern PRBS31

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.2** *P* **29** *L* **27** # **354**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

The 'further' is confusing, as in the current diagram, the signal is impaired by noise first and filtering after.

Suggested Remedy

Delete 'further'

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.2** *P* **29** *L* **31** # **355**

king, jonathan BBN

Comment Type **TR** *Comment Status* **X**

Draft 2.0 description of overload test is inconsistent with the transmitter range of OMA and mean power compliance (figure 68.5) Max power (0.5dBm), ER (3.5dB) and OMA (1.5dBm) are mutually inconsistent Any two of the three could be achieved - which?

Suggested Remedy

Change overload test to +0.5dBm mean power and 6.4dB ER which would give +1.5dBm OMA alternatively delete line 31 and 46 on page 29 referring to ER of test waveforms (since ER is immaterial for the TP3 tests) alternatively set overload test to +0.5dBm mean power and 3.5dB ER

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.2** *P* **29** *L* **43** # **356**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

using ... using

Suggested Remedy

Change first one to 'by'

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.2** *P* **29** *L* **43** # **357**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

redundant word

Suggested Remedy

delete 'the' before Qsq

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.3** *P* **29** *L* **46** # **358**

Lindsay, Tom ClariPhy Communicati

Comment Type **T** *Comment Status* **X**

The current text says that calibration should be done without the ISI generator. The note above Figure 68-10 says that other implementation options for pulse shaping are allowed, so that a block named ISI generator might not even be used. We need a calibration procedure that is not dependent on the implementation that is shown.

Suggested Remedy

Change the text to ""The extinction ratio of the optical output test signal is intended to represent the extinction ratio of a minimally compliant transmitter, where eye closure causes the extinction ratio to be lower than what would be determined by a ratio of the two levels used to determine OMA. The extinction ratio can be calibrated with the same square wave signal used to calibrate OMA of the test signal, but to account for the eye closure, the target value for extinction ratio should be 4.3 dB with the square wave pattern.""

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.3** *P* **29** *L* **46** # **359**

Kolesar, Paul Systimax

Comment Type **T** *Comment Status* **X**

There is no Gaussian filter in the apparatus of figure 68-10. Perhaps what was meant was Gaussian noise generator.

Suggested Remedy

Consider replacing ""Gaussian filter"" with ""Gaussian noise generator"".

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.3** *P* **30** *L* **7** # **360**

James, David JGG

Comment Type **E** *Comment Status* **X**

Wrong symbol.

Suggested Remedy

Replace the multiply dot with an x, as per Style Manual preferences.

Response *Response Status* **O**

Cl **68** *SC* **68.6.9.3** *P* **31** *L* **1** # **361**

Booth, Brad Intel

Comment Type **TR** *Comment Status* **X**

Figure 68-12. A few things: the figure seems to be a long way from the text that references it, the title for the figure is extremely long, and the figure should contain 3 graphs. The first word of the figure title is ""required""; therefore, it would be expected that a ""shall"" would apply to these graphs and each graph would be clearly shown.

Suggested Remedy

Change the 2nd to last paragraph of 68.6.9.3 to read: The measured test signals for each of the three cases specified in Table 68-4, where the test signal, Scal, is a single ONE bit (rectangular pulse with 1 UI width) surrounded by ZEROs, shall be as shown in Figure 68-12. Change the title of Figure 68-12 to be: Figure 68-12-Measured receiver test signals Change the single graph to be 3 separate graphs, each showing Time (UI) from 0.000 to 5.000.

Response *Response Status* **O**

Cl **68** *SC* **68.8** *P* **33** *L* **48** # **362**

Booth, Brad Intel

Comment Type **E** *Comment Status* **X**

Reference only one cabling model.

Suggested Remedy

My personal preference would be to reference the cabling model in Figure 52-14 as that is a 10G cabling model, but the draft contains more references to Figure 38-7. Pick one and be consistent on its use.

Response *Response Status* **O**

Cl **68** *SC* **68.8** *P* **34** *L* **1** # **363**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

If people want the best yield at 300 m they shouldn't use additional connectors (or they should use superior quality connectors). We could let users just see a lower yield - as most cables contain multiple fibers, that may not be much of a problem. The more traditional approach would be to define a 'clean' system and then users will cut corners or not, anyway, according to their own priorities. But it would be a service to users to give them a hint that trade-offs are worth considering.

Suggested Remedy

Change 'A channel may contain additional connectors or other optical elements as long as the optical characteristics of the channel, such as attenuation, dispersion, reflections, modal bandwidth and total connector loss meet the specifications.' to 'A compliant channel may not contain additional connectors, splices or other optical elements.' and add a new paragraph, 'Trade offs between channel length, fiber quality, and connector number and quality may be considered.'

Response *Response Status* **O**

Cl **68** *SC* **68.8** *P* **34** *L* **15** # **364**

Dawe, Piers Agilent

Comment Type **T** *Comment Status* **X**

Loss of connectors and splices depends whether the signal is from a loss test or an LRM signal (tighter launch).

Suggested Remedy

Add footnote to 'Losses of all connectors and splices', 'This is the loss as measured with a test instrument. The loss for a compliant 10GBASE-LRM signal is smaller.'

Response *Response Status* **O**

Cl **68** *SC* **68.8** *P* **34** *L* **25** # **365**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

number and unit split apart

Suggested Remedy

Use nonbreaking space between 50 and um. Redo the 'shrink to fit/fixed table width' anyway.

Response *Response Status* **O**

Cl **68** *SC* **68.8** *P* **34** *L* **4** # **366**

Dawe, Piers Agilent

Comment Type **T** *Comment Status* **X**

What's the difference between ANSI/TIA/EIA-526-14A/Method B and IEC 61280-4-1/Method 1? If they say the same, I think policy is to refer to just the international standard. If they differ, which do we mean?

Suggested Remedy

After review, delete 'or ANSI/TIA/EIA-526-14A/Method B'

Response *Response Status* **O**

Cl **68** *SC* **68.8** *P* **34** *L* **4** # **367**

Thompson, Geoff

Comment Type **TR** *Comment Status* **X**

The text:
"Insertion loss measurements of installed multimode fiber cables are made in accordance with ANSI/TIA/EIA-526-14A/Method B or IEC 61280-4-1/Method 1." is ambiguous. I don't know how to do a conformance check on this unless I do both tests. Since this is supposed to be drafted as an international standard the TIA reference should be deleted.

Suggested Remedy

Change the text to read:
"Insertion loss measurements of installed multimode fiber cables are made in accordance with IEC 61280-4-1/Method 1."

Response *Response Status* **O**

Cl **68** *SC* **68.8** *P* **34** *L* **4** # **368**

Booth, Brad Intel

Comment Type **T** *Comment Status* **X**

There are cable specifications referenced and the ability to choose between them. Is there a difference between these or are they the same?

Suggested Remedy

If they're different, explain to the reader how they should select. If there is no difference, select one (preferrably the international one) and use that; a footnote could be added to indicate that the other is equivalent.

Response *Response Status* **O**

Cl **68** *SC* **68.9.1** *P* **28** *L* **1** # **369**

George, John

Comment Type **TR** *Comment Status* **X**

The comprehensive stress receiver sensitivity test does not include response variations caused by polarization changes and fiber shaking. Such impairments have been shown to occur in MMFs in balemarthy_1_0105, king_1_1104, and meadowcroft_1_0105.

Suggested Remedy

A dynamic component must be added to the comprehensive stressed receiver sensitivity test. A suggested approach: During the comprehensive stressed receiver sensitivity test, the tap weights of the ISI stressors should be randomly varied at a frequency from 6 to 20 Hz in such a way as to produce PIE-D variations, relative to the statically measured PIE-D, of +/- 1.25 dB for offset launch and +/- 1.75 dB for center launch.

Response *Response Status* **O**

Cl **68** *SC* **68.9.1** *P* **34** *L* **38** # **370**

Dawe, Piers Agilent

Comment Type **T** *Comment Status* **X**

Does IEC 60793-2 contain stringent (uncabled-fiber style) loss/km specs? Clause 52 said 'IEC 60793-2 and the requirements of Table 52-25 where they differ...'

Suggested Remedy

Could change 'IEC 60793-2, the requirements of Table 68-7' to 'IEC 60793-2, the requirements of Table 68-7 where they differ'. Might then have to add a row to table 68-7 for Fiber cable attenuation max 1.5 dB/km. Or change to 'IEC 60793-2 (except attenuation), the requirements of Table 68-7'.

Response *Response Status* **O**

Cl **68** SC **68.9.1** P **34** L **38** # **371**

Dawe, Piers Agilent

Comment Type **T** *Comment Status* **X**

It might be helpful to mention the newly available MMF cable standards here. We can't enforce them because it would be troublesome to establish if old cable complies to new standards - but we can mention them in a permissive way. Steve, I hope the following is OK:

Suggested Remedy

At the end of the paragraph, add 'Multimode cables chosen from IEC 60794-2-10, IEC/PAS 60794-2-11 or IEC/PAS 60794-3-12 may be suitable.' Add these three new standards to the references section 1.3:
IEC 60794-2-10 Optical fibre cables - Part 2-10: Indoor optical fibre cables - Family Specification for simplex and duplex cables Publication date 2003-01-27
IEC/PAS 60794-2-11 Optical fibre cables - Part 2-11: Indoor optical fibre cables - Detailed specification for simplex and duplex cables for use in premises cabling Publication date 2004-03-10
IEC/PAS 60794-3-12 Optical fibre cables - Part 3-12: Outdoor cables - Detailed specification for duct and directly buried optical telecommunication cables for use in premises cabling Publication date 2004-03-10 Note that the ones marked 'PAS' are not full standards yet, so add editor's box reminding us to check their status in a future ballot. If they don't become full standards I think we can qualify our references and explain what we are doing, or delete these references.

Response *Response Status* **O**

Cl **68** SC **68.9.2.1** P **34** L **51** # **372**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

Don't allow the third connection in the standard (some users will do it anyway: that's fine!)

Suggested Remedy

Change 'For example, this allocation supports three connections with an insertion loss equal to 0.5 dB (or less) per connection, or two connections (as shown in Figure 38-7) with an insertion loss equal to 0.75 dB per connection.' to 'For example, this allocation supports two connections (as shown in Figure 38-7) with an insertion loss equal to 0.75 dB per connection.'. Delete the third sentence.

Response *Response Status* **O**

Cl **68** SC **68.9.2.1** P **34** L **51** # **373**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

Here we need to explain the difference between loss as measured and the loss suffered by an LRM signal.

Suggested Remedy

After 'splice loss.', insert new sentence, 'Loss is defined as the loss measured by the appropriate instrument. For connector and splice loss, the actual change in LRM signal strength is less than the measured loss. For non-discrete fiber or cable attenuation, the two are the same.'

Response *Response Status* **O**

Cl **68** SC **68.9.2.2** P **35** L **5** # **374**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Extra commas, consistency

Suggested Remedy

Remove four commas

Response *Response Status* **O**

Cl **68** SC **68.9.3** P **35** L **7** # **375**

Booth, Brad Intel

Comment Type **TR** *Comment Status* **X**

Is there any difference between these requirements? This is a normative reference and you're giving the reader a choice.

Suggested Remedy

If there is a difference, pick one and reference it. If no difference, pick one to reference and add a footnote that the other contains the same requirements.

Response *Response Status* **O**

Cl **68** *SC* **68.9.3** *P* **35** *L* **8** # **376**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

Do we need a reflection spec for patchcords?

Suggested Remedy

If we do, add 'Any discrete reflectance within the patchcord shall be less than -20 dB.'

Response *Response Status* **O**

Cl **68** *SC* **68-6** *P* **18** *L* **46** # **377**

king, jonathan BBN

Comment Type **TR** *Comment Status* **X**

Table 68-3 The alternative launch for OM3 described in table 68-3 does not improve OM3 fibre coverage and should be deleted.

Suggested Remedy

Delete lines 46 and 47 in table 68-3

Response *Response Status* **O**

Cl **68** *SC* **Figure 68-1** *P* **13** *L* **30** # **378**

Law, David 3Com

Comment Type **T** *Comment Status* **X**

I believe that the OSI reference model 'Physical' layer includes the MDI.

Suggested Remedy

In Figure 68-1 it is unclear where the dotted line from the bottom of the OSI Physical layer goes. It should align to interface between the top of the medium and the bottom of the MDI (see Figure 52-1).

Response *Response Status* **O**

Cl **68** *SC* **Figure 68-1** *P* **13** *L* **33** # **379**

Law, David 3Com

Comment Type **E** *Comment Status* **X**

Typo.

Suggested Remedy

Shouldn't '10GBASE-R' read '10GBASE-LRM'.

Response *Response Status* **O**

Cl **68** *SC* **Figure 68-10** *P* **28** *L* **51** # **380**

Lindsay, Tom ClariPhy Communicati

Comment Type **E** *Comment Status* **X**

Purpose for using scope is used for calibration. Cal may include acquisition as one of it's steps, but we should focus on the overall purpose.

Suggested Remedy

Change end of scope block from ""... for waveform acquisition"" to ""... for waveform calibration"".

Response *Response Status* **O**

Cl **68** *SC* **Figure 68-10** *P* **29** *L* **28** # **381**

Lindsay, Tom ClariPhy Communicati

Comment Type **T** *Comment Status* **X**

The current text says that calibration should be done without the ISI generator. The note above Figure 68-10 says that other implementation options for pulse shaping are allowed, so that a block named ISI generator might not even be used. We need a calibration procedure that is not dependent on the implementation that is shown.

Suggested Remedy

Option 1 (my preference) Change to ""... signal, without ISI impairment, is the value..."". Option 2 Change to ""... signal without ISI impairment due to the ISI generator and pulse shaping filter, is the value..."".

Response *Response Status* **O**

Cl **68** *SC* **Figure 68-3** *P* **21** *L* **8** # **382**

Thaler, Pat Agilent Technologies

Comment Type **TR** *Comment Status* **X**

This figure is only referenced ""for illustration"" which doesn't make it clear that it is normative. Since spectral width would only be specified at three center wavelenghts if the figure was informative, I assume the intent is for the figure to be normative.

Suggested Remedy

Replace table 68-3 lines 11-13 as follows: RMS spectral width at 1260 nm max 2.4 nm RMS spectral width between 1260 nm and 1300 nm max see Figure 68-3 (or you could put 2.4 + 0.04 * (center wavelength - 1260)) RMS spectral width between 1300 nm and 1335 nm max 4

Response *Response Status* **O**

Cl **68** *SC* **Figure 68-8** *P* **27** *L* **10** # **383**

Lindsay, Tom ClariPhy Communicati

Comment Type **E** *Comment Status* **X**

The word acquisition may be confusing here.

Suggested Remedy

Remove last line of scope block ""for waveform aquisition"".

Response *Response Status* **O**

Cl **68** *SC* **Figure 68-9** *P* **27** *L* **41** # **384**

Lindsay, Tom ClariPhy Communicati

Comment Type **T** *Comment Status* **X**

The waveform options for uncorrelated jitter do not include the square wave, so the square waveform figure should be replaced. This was discussed and agreed on a TP2 call.

Suggested Remedy

Replace figure with new one, sent separately as ""Mixed jitter waveform.doc"".

Response *Response Status* **O**

Cl **68** *SC* **general** *P* **13** *L* # **385**

Grow, Robert Intel

Comment Type **E** *Comment Status* **X**

After review, I don't understand why the Task Force would choose to write a new clause rather than making it a modification of existing clauses.

Suggested Remedy

Reconsider. Figure 68-1 should simply be a reference to Figure 52-1 as this is just another 10GBASE-R PHY. Many paragraph in the early material are either virtually identical or the differences are too subtle for me to understand why they need to be repeated in this clause. Subclause 68.5 could be 52.8.

Response *Response Status* **O**

Cl **68** *SC* **Table 68-1** *P* **15** *L* **38** # **386**

Lindsay, Tom ClariPhy Communicati

Comment Type **T** *Comment Status* **X**

The informative Rx test may use an OMA that is less than Received power in OMA (min), so a warning should be given.

Suggested Remedy

Add a footnote to the 3rd row: Informative receiver test conditions may use a OMA that is less than Received power in OMA (min) in Table 68-4. It is recommended that the system allows operation, including reporting of BER, during these test conditions.

Response *Response Status* **O**

Cl **68** *SC* **Table 68-2** *P* **17** *L* **11** # **387**

Dallesasse, John Emcore Corporation

Comment Type **TR** *Comment Status* **X**

Inadequate modeling has been done to support the assertion of an operating range to 240 meters on 400/400 MHz-km fiber.

Suggested Remedy

The group has 2 options: 1) Present data to confirm the operating range specified in Table 68-2. 2) Eliminate 400/400 MHz-km fiber from Table 68-2. Option 2 will ultimately require a successful vote to remove support of 400/400 MHz-km fiber from the objectives.

Response *Response Status* **O**

Cl **68** *SC* **Table 68-2** *P* **17** *L* **4** # **388**

Grow, Robert Intel

Comment Type **E** *Comment Status* **X**

The period charcter is used instead of dot (MHz.km).

Suggested Remedy

Replace with a symbol font dot.

Response *Response Status* **O**

Cl **68** *SC* **Table 68-2** *P* **17** *L* **7** # **389**

Dallesasse, John Emcore Corporation

Comment Type **TR** *Comment Status* **X**

The operating range of 300 meters has an unspecified statistical success rate. Because the goal of a low-cost module is not consistent with the goal of > 99% link success due to the added cost associated with more complex equalizer architectures, the standard needs to explicitly state the best estimate of link success for a duplex link.

Suggested Remedy

Add a footnote f to Table 68-2: f) The estimated statistical success rate for achieving a BER of less than 10^-12 on 300 meter links is less than 91%. This assumes a single-link success rate of 95% or higher, and may need to be adjusted as final parameters are selected by the group.

Response *Response Status* **O**

Cl **68** *SC* **Table 68-3** *P* **18** *L* **15** # **390**

Lindsay, Tom ClariPhy Communicati

Comment Type **TR** *Comment Status* **X**

There are 2 concerns for max optical power - laser safety and Rx overload. Laser safety is covered already. However, Rx overload control should be specified as a peak optical power as it is typically peak power that causes overload distortion that can increase Rx implementation penalties. The current overshoot masks, OMA and average power are too indirect as ways to control this. Assuming symmetry, peak power could be 3.5 dBm, 3 dB above the max average power of 0.5 dBm. The proposed spec gives the same value as determined by the current limits for max OMA and and max avg power (ER=8 dB) but with no overshoot. This value matches the proposed limit for TP2 peak power. Note that Received power in OMA (overload) is still useful as a TP3 test condition and should not be replaced.

Suggested Remedy

Change name to Peak launch power. Set limit to 2.6 dBm. This value was determined by the current limits for max OMA and and max avg power (ER=8 dB) with no overshoot. IF this needs a test method, then it should be done on a scope in averaging mode with 7.5 GHz filter in place. Pattern should be same as TWDP pattern options. Is square wave a possibility?

Response *Response Status* **O**

Cl **68** *SC* **Table 68-3** *P* **18** *L* **17** # **391**

Lindsay, Tom ClariPhy Communicati

Comment Type **TR** *Comment Status* **X**

General communication theory tells us that RF signal energy or power is the best measure of signal strength. This especially applies to EDC systems such as LRM, where receivers can approach matched filter bounds. In contrast, OMA is a point-property of selected bits in special square wave patterns – it does not consider signal power of other bits in complex patterns and so is not complete as a characteristic of signal strength for LRM. An example of the problem is pre-emphasis, which can increase SNR via an increase in the RF signal strength, but the gain is not apparent in the use of OMA which ignores the pre-emphasized bits. Further, OMA is difficult to define and measure accurately, especially for waveforms with overshoot, ringing, tilt, etc. Ideally, the signal strength metric should allow a tradeoff between power and penalty (see separate penalty comment) as done with TDP in LR.

Suggested Remedy

Modify the TWDP code to calculate signal strength based on the full RF signal power and to be variable depending on a penalty result.

Response *Response Status* **O**

Cl **68** *SC* **Table 68-3** *P* **18** *L* **28** # **392**

Lindsay, Tom ClariPhy Communicati

Comment Type **TR** *Comment Status* **X**

I am not yet convinced that we've really evaluated the range of possibilities of Tx waveforms. As an example, it is known that pre-cursor fiber responses can lead to higher implementation penalties for finite length equalizers, and so the standard might want to encourage (at least not discourage) transmitter pre-compensation for such channels, providing they have small impact to penalties for post-cursor channels. Another concern is that we have not seen data from real transmitters over conditions such as temperature and aging and how they affect link budget penalties. We should also assess VCSEL waveforms.

Suggested Remedy

Study pre-compensation carefully and gather transmitter characteristics over more operating conditions. Modify the eye mask coordinates as appropriate in response to this work. This could also affect 68.6.5.

Response *Response Status* **O**

Cl **68** *SC* **Table 68-3** *P* **18** *L* **30** # **393**

Lindsay, Tom ClariPhy Communicati

Comment Type **TR** *Comment Status* **X**

The TWDP value should track the TP3 stress levels. However, it has been observed that stress levels for real waveforms can be greater than TP3 stress levels for finite length EQs, even though their infinite length results are equal or better. So, perhaps TWDP should consider finite EQs and/or some margin that forces real Tx waveforms to have tighter results than the TP3 levels. Finite equalizer lengths may also be able to discriminate and encourge the benefits of pre-compensation of Tx waveshaping. This could be helpful for finite EQs in real applications.

Suggested Remedy

This issue requires more study. Possible outcomes are 1. Run TWDP with shorter equalizer(s) and require the penalty results be not greater than the corresponding TP3 stresses with the same shorter EQs. 2. Set TWDP limits to be somewhat more stringent than the TP3 stress levels to ensure interoperability.

Response *Response Status* **O**

Cl **68** *SC* **Table 68-3** *P* **18** *L* **30** # **394**

Bhoja, Sudeep Big Bear Networks

Comment Type **TR** *Comment Status* **X**

The 5dB value for the Transmitter Waveform Dispersion Penalty needs to be changed. Previous contributions such as lindsay_3_1104 have shown that TP2 & TP3 tests and limits should be linked. The PIE-D value for 99% coverage based on a 47.1ps reference Tx and Gen67YY fiber model with connectors is 4.5dB. This number is lower than the 5dB currently specified.

Suggested Remedy

Change the 5dB value to 4.5dB

Response *Response Status* **O**

Cl **68** *SC* **Table 68-3** *P* **18** *L* **33** # **395**

Lindsay, Tom ClariPhy Communicati

Comment Type **E** *Comment Status* **X**

If 62.5 and 50 micron OM2 alternative launch specs are the same, so they can be reduced to one section and save some space.

Suggested Remedy

1. Change line 33 under Description to ""Optical launch specifications for 62.5 micron fiber and OM2 50 micron fiber:"" 2. Delete rows 39-42 from the table.

Response *Response Status* **O**

Cl **68** *SC* **Table 68-3** *P* **18** *L* **39** # **396**

Jaeger, John Big Bear Networks

Comment Type **T** *Comment Status* **X**

The 50um 400/400 fiber type called out in Table 68-2 is not identified as either OM2 or OM3 in type. As such, the optical launch specification for the 50um fibers in Table 68-3 as currently written in lines 39-47 do not specify which launch or launches should be used for the 400/400 fiber - as Table 68-3 only calls out OM2 & OM3 for 50um fibers.

Suggested Remedy

Decide which launch(es) are appropriate for 50um 400/400 fiber and add the correct reference into Table 68-3. Alternatively, remove the 50um 400/400 fiber type from Table 68-2.

Response *Response Status* **O**

Cl **68** *SC* **Table 68-4** *P* **19** *L* **19** # **397**

Lindsay, Tom ClariPhy Communicati

Comment Type **TR** *Comment Status* **X**

Rx overload should be specified as a peak optical power, as it is typically peak power that causes overload distortion in the Rx that can increase implementation penalties. The TP2 overshoot eye mask, OMA and average power are too indirect as ways to control this. Assuming symmetry, peak power could be 3.5 dBm, 3 dB above the max average power of 0.5 dBm. The proposed spec gives the same value as determined by the current limits for max OMA and and max avg power (ER=8 dB) but with no overshoot. This value matches the proposed limit for TP2 peak power. Note that Received power in OMA (overload) is still useful as a TP3 test condition and should not be replaced.

Suggested Remedy

Insert a new row. The name should be Peak received optical power (overload). Set limit to 2.6 dBm. IF this needs a test method, then it should be done on a scope in averaging mode with 7.5 GHz filter in place. Pattern should be same as TWDP pattern options. Is square wave a possibility?

Response *Response Status* **O**

Cl **68** *SC* **Table 68-4** *P* **19** *L* **28** # **398**

Rommel, Albrecht Acuid Corporation

Comment Type **TR** *Comment Status* **X**

The intention of the noise calibration for the comprehensive stressed receiver test is to emulate a noise level as it would appear at TP3 under realistic conditions. The LRM link budget provides a SNR at the electrical EDC input of of 30dB(e) in presence of ISI, assuming 14.1 dBm optical receiver sensitivity and 6.5dB(o) dispersion penalty. 1.5dB(e) can be assumed as a realistic SNR loss due to optical receiver (TIA) noise. The resulting required SNR at TP3 of 31.5 dB(e) can be emulated with a noise load of 25.5 dB(e) in absence of ISI, assuming an IFR of 3dB(o). The exact value for IFR needs to be calculated as soon as the stressors for the comprehensive stressed receiver test have been defined. A noise load of 25.5dB(e) corresponds to a value for Qsq = 18.8

Suggested Remedy

In Table 68-4, Conditions of comprehensive stressed receiver tests, change the value Qsq from 11.5 to 18.5

Response *Response Status* **O**

Cl **68** *SC* **Table 68-4** *P* **19** *L* **28** # **399**

Lindsay, Tom ClariPhy Communicati

Comment Type **TR** *Comment Status* **X**

The current noise loading is far too severe. It imposes far-end penalties on the source end. For example, -128 dB/Hz integrates to Qsq = 29 which is a launch penalty of 0.1 dB, whereas currently the launch end portion for RIN is 0.4 dB! This was discussed during the 4/26 TP3 call. A spreadsheet model shows that RIN produces 0.3 dB at 300 meters. A related analysis can be done to determine what value of source noise is required to create 0.5 dB of power penalty for modal noise. The two noises are combined into a single noise source for the test to produce approx 0.8 dB total penalty.

Suggested Remedy

Change value to 18.

Response *Response Status* **O**

Cl **68** *SC* **Table 68-4** *P* **19** *L* **28** # **400**

Bhoja, Sudeep Big Bear Networks

Comment Type **T** *Comment Status* **X**

The TP3 measurement configuration described in Figure 68-10 is supposed to add gaussian noise to emulate the RIN & modal noise contributions that occur in a real fiber link. The level of the Gaussian noise generator is specified by the Qsq parameter which is set to a value of 11.5. This number significantly exceeds the noise contribution from the combination of RIN specified at -128dB/Hz and a modal noise penalty of 0.5dB. Consequently, the level of PIE-D that can be supported by a Rx under test will be negatively impacted.

Suggested Remedy

A higher number for Qsq based on discussions in the TP3 adhoc group should be inserted here.

Response *Response Status* **O**

Cl **68** *SC* **Table 68-4** *P* **19** *L* **31** # **401**

Bhoja, Sudeep Big Bear Networks

Comment Type **TR** *Comment Status* **X**

The Pre-cursor, Symmetrical & Post-cursor ISI parameter values need updating. These numbers predated the inclusion of the composite launch and hence exceed the 99th percentile PIE-D value of 4.5dB based on Gen67YY fiber model with 2 connectors. In the weekly TP3 calls, we agreed without dissent that the TP3 stressors will be chosen from the set provided by John Ewen and presented in the following message on the reflector: <<http://www.ieee802.org/3/10GMMFSG/email/msg00767.html>> Propose using pre-cursor #23, Symmetrical row #22 and Post-cursor row #20 which corresponds to approx PIE-D target of 4.5dB

Suggested Remedy

Replace the values as specified below: Pre-cursor{A1, A2, A3, A4} = {0.354 0.038 0.412 0.196} Symmetrical{A1, A2, A3, A4} = {0.086 0.387 0.096 0.430} Post-cursor{A1, A2, A3, A4} = {0.256 0.397 0.110 0.237}

Response *Response Status* **O**

Cl **68** *SC* **Table 68-4** *P* **19** *L* **32** # **402**

Lindsay, Tom ClariPhy Communicati

Comment Type **TR** *Comment Status* **X**

Stressors need to be updated. Stress levels should represent the coverage levels that 802.3 is accustomed to.

Suggested Remedy

For pre-cursor, symmetrical, and post-cursor, cases respectively, change to 0.354 0.038 0.412 0.196 0.086 0.387 0.096 0.430 0.256 0.397 0.110 0.237 These represent PIE-Ds of just over 4.5 dB when convolved with the 47.1 psec Gaussian waveshape. They are from John Ewen's tables. Figure 68-12 and Table 68-6 will also need to be updated to reflect the new responses. I have not created a tool to do this, but others have.

Response *Response Status* **O**

Cl **68** *SC* **Table 68-4** *P* **19** *L* **39** # **403**

Lindsay, Tom ClariPhy Communicati

Comment Type **E** *Comment Status* **X**

The simple Rx test has only one parameter and we can save some space.

Suggested Remedy

1. Change line 39 to ""Simple stressed receiver test signal rise and fall times (20-80%)"". Move value into same row. 2. Delete current line 41.

Response *Response Status* **O**

Cl **68** *SC* **Table 68-4** *P* **19** *L* **41** # **404**

Lindsay, Tom ClariPhy Communicati

Comment Type **T** *Comment Status* **X**

Expecting the comprehensive test to use 4.5 dB PIE-Ds, the rise/fall time spec should be adjusted. The value should be based on interpolation (and rounding) within the spreadsheet developed by Sudeep and me for 4/19 TP3 call.

Suggested Remedy

Set value to 125 psec.

Response *Response Status* **O**

Cl **68** *SC* **Table 68-4** *P* **19** *L* **41** # **405**

Bhoja, Sudeep Big Bear Networks

Comment Type **T** *Comment Status* **X**

The 20%-80% signal rise and fall times for the simple stressed receiver test is currently set to a value of 129ps. In the weekly TP3 calls it was agreed without dissent that the 20%-80% rise/fall time parameter will be chosen from a table and presented in an e-mail to the reflector. The table can be found at <<http://www.ieee802.org/3/10GMMFSG/email/msg00803.html>> The current value of 129ps corresponds to a PIE-D value of 4.75dB and does not constitute reasonable worst case. A PIE-D value of 4.5dB corresponds to a 99% yield based on Gen67YY fiber model with connectors.

Suggested Remedy

Change the value to 125ps from 129ps. This would correspond to a PIE-D value of 4.5dB.

Response *Response Status* **O**

Cl **68** *SC* **Table 68-4** *P* **20** *L* **5** # **406**

Lindsay, Tom ClariPhy Communicati

Comment Type **T** *Comment Status* **X**

The current text says that calibration should be done without the ISI generator. The note above Figure 68-10 says that other implementation options for pulse shaping are allowed, so that a block named ISI generator might not even be used. We need a calibration procedure that is not dependent on the implementation that is shown.

Suggested Remedy

Remove ""due to the ISI generator"" from the end of the sentence.

Response *Response Status* **O**

Cl **68A** *SC* *P* **41** *L* **12** # **407**

Booth, Brad Intel

Comment Type **E** *Comment Status* **X**

""the 802.3aq standard."" is an incorrect reference.

Suggested Remedy

Change to read: ""Clause 68.""

Response *Response Status* **O**

Cl **68A** SC **1** P **41** L **27** # **408**
Thompson, Joey Circadiant Sysytems, I

Comment Type **T** *Comment Status* **X**

Confusing mathematical notation.

Suggested Remedy

Insert a ""multiplicative dot"" before ""(T/(2N..."".

Response *Response Status* **O**

Cl **68A** SC **1** P **41** L **32** # **409**
Lindsay, Tom ClariPhy Communicati

Comment Type **T** *Comment Status* **X**

Qsq is used for SNR for TP2, etc., and Q( ) is used in Annex 68A. A note in the Annex would help avoid possible confusion.

Suggested Remedy

Add a footnote tied to Q( ) in line 32: ""Although related in definition, Q( ) used in this Annex is distinct from Qsq used in clause 68.

Response *Response Status* **O**

Cl **68A** SC **1** P **41** L **41** # **410**
Thompson, Joey Circadiant Sysytems, I

Comment Type **T** *Comment Status* **X**

Confusing mathematical notation.

Suggested Remedy

Insert a ""multiplicative dot"" before ""(T/(2N..."".

Response *Response Status* **O**

Cl **68A** SC **4** P **14** L **42** # **411**
Ghiasi, Ali Broadcom

Comment Type **ER** *Comment Status* **X**

Please add patchcords to the Fig 68-2 so it resembles the application or create a new Fig to show the cable plant.

Suggested Remedy

Response *Response Status* **O**

Cl **68A** SC **5** P **17** L **20** # **412**
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **X**

Channel variation rate unreasonably too low, change 10Hz to 1 KHz.

Suggested Remedy

Response *Response Status* **O**

Cl **68A** SC **6** P **18** L **31** # **413**
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **X**

Uncorrrelated jitter value of 0.033 RMS is too high and puts unreasonable penalty. Reduce 0.033 UI to 0.023. You also need to define what uncorrelated jitter is or provide a reference.

Suggested Remedy

Response *Response Status* **O**

Cl **68A** SC **6** P **19** L **44** # **414**
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **X**

Current jitter tolerance test only at a single frequncy will not detect potential weakness in the receiver. Suggest to use jitter tolerance mask per IEEE 802.3ae Fig 52-4.

Suggested Remedy

Response *Response Status* **O**

Cl **68A** SC **68A** P **41** L **10** # **415**
Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

No-value sentence, now the text is in the draft.

Suggested Remedy

Delete 'An upper limit on penalty thus measured is compared against a limit specified by the 802.3aq standard.'

Response *Response Status* **O**

Cl **68A** SC **68A** P **41** L **10** # **416**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Consistent terminology

Suggested Remedy

Change 'TP2' to 'TWDP' - but see another comment. At line 48, change 'The TP2 penalty' to 'TWDP'.

Response *Response Status* **O**

Cl **68A** SC **68A** P **41** L **10** # **417**

Dawe, Piers Agilent

Comment Type **T** *Comment Status* **X**

TWDP isn't really a penalty; use consistent terminology.

Suggested Remedy

Change 'This annex outlines the TP2 test methodology for measuring a penalty for purposes' to 'This annex outlines the methodology for measuring TWDP for purposes'. Change 'The penalty is defined...' to 'TWDP is defined...'.

Response *Response Status* **O**

Cl **68A** SC **68A** P **41** L **11** # **418**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Somewhere near the beginning of 68A we ought to refer to 68.6.6.

Suggested Remedy

Insert second sentence 'The normative TWDP procedure and algorithm is specified in 68.6.6.'

Response *Response Status* **O**

Cl **68A** SC **68A** P **41** L **28** # **419**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

OMA_RCV appears to be a function (like Q), but it's a variable

Suggested Remedy

Use multiply dot or cross after RCV in first and third equations

Response *Response Status* **O**

Cl **68A** SC **68A** P **41** L **28** # **420**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Please number the equations

Suggested Remedy

Please number the equations

Response *Response Status* **O**

Cl **68A** SC **68A** P **41** L **38** # **421**

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **X**

Don't use 'e' notation. In the remedy, /sup/ means toggle to or from superscript.

Suggested Remedy

10/sup/-12/sup/

Response *Response Status* **O**

Cl **68A** SC **68A** P **41** L **50** # **422**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

transmitter system under test?

Suggested Remedy

Change to 'transmitting system under test'.

Response *Response Status* **O**

Cl **68A** SC **68A** P **41** L **52** # **423**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

This isn't true with the part-pattern technique in the draft: 'capture at least one complete cycle of the data pattern'

Suggested Remedy

Change to 'capture the signal with at least seven...'.

Response *Response Status* **O**

Cl **68A** *SC* **68A** *P* **41** *L* **53** # **424**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

3-dB

Suggested Remedy

3 dB (I think)

Response *Response Status* **O**

Cl **68A** *SC* **68A** *P* **41** *L* **54** # **425**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

The scope effectively doesn't filter the captured waveform, but vice versa.

Suggested Remedy

Change to 'filter the waveform before capture.'

Response *Response Status* **O**

Cl **68A** *SC* **68A** *P* **41** *L* **6** # **426**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

It's TWDP not TOWDP

Suggested Remedy

Delete 'optical'.

Response *Response Status* **O**

Cl **68A** *SC* **68A** *P* **42** *L* **16** # **427**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

May not be a complete 'cycle'.

Suggested Remedy

Change 'corresponding to one complete cycle of the data sequence.' to 'of length and position specified - e.g. one complete cycle of PRBS9.' Add new sentence: ' The end and beginning of the captured sequence should match.'

Response *Response Status* **O**

Cl **68A** *SC* **68A** *P* **42** *L* **17** # **428**

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **X**

Need to change the list of inputs when we have worked out how to make the algorithm measure a signal strength.

Suggested Remedy

per comment

Response *Response Status* **O**

Cl **68A** *SC* **68A** *P* **42** *L* **17** # **429**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Is it compulsory that the re-sampled waveform have 16 samples per bit period?

Suggested Remedy

Decide and make clear

Response *Response Status* **O**

Cl **68A** *SC* **68A** *P* **42** *L* **20** # **430**

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **X**

Need to change description of alignment when we have worked out how it's done.

Suggested Remedy

per comment

Response *Response Status* **O**

Cl **68A** *SC* **68A** *P* **42** *L* **20** # **431**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

This is confusing through over-use of 'sequence': 'The data sequence used to generate the transmitted sequence.' There's no other occurrence of 'transmitted sequence'.

Suggested Remedy

Change 'transmitted sequence' to 'transmitted waveform'.

Response *Response Status* **O**

Cl **68A** *SC* **68A** *P* **42** *L* **23** # **432**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Empty line?

Suggested Remedy

Remove

Response *Response Status* **O**

Cl **68A** *SC* **68A** *P* **42** *L* **31** # **433**

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **X**

Need to change description of anti-aliasing filter to follow changes in 68.6.6.

Suggested Remedy

per comment

Response *Response Status* **O**

Cl **68A** *SC* **68A** *P* **42** *L* **34** # **434**

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **X**

re 'a standard fractionally-spaced MMSE-DFE receiver'; what standard? Without a reference, this is empty.

Suggested Remedy

Delete 'standard'.

Response *Response Status* **O**

Cl **68A** *SC* **68A** *P* **42** *L* **39** # **435**

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **X**

Out of place? Does this sentence really mean channel input: 'The channel input is a periodic data sequence ... where N is the length of one period (e.g. 511 for PRBS9).'?

Suggested Remedy

If it's the captured waveform, move it to line 17, and say 'The captured waveform x(k)' on line 25. If it's the data sequence, move it to line 20 and say 'The data sequence x(k) used'. If it's the FFE input, to line 33. Avoid the term 'channel input', correct the terminology, put a label {x} or x(k) by the thing it is, to give the reader a clue. It would help to write x(k) = {x(0),x(1)... (if that is the case) to tie these vectors back to figure 68A-1.

Response *Response Status* **O**

Cl **68A** *SC* **68A** *P* **42** *L* **43** # **436**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Repetition, and too much discourse in the middle of a recipe list of actions.

Suggested Remedy

Delete 'The measured waveform is assumed ... then sampled at rate 2/T.'.

Response *Response Status* **O**

Cl **68A** *SC* **68A** *P* **42** *L* **5** # **437**

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **X**

Figure 68A-1 doesn't show the important scope filter

Suggested Remedy

Insert another box between TP2 transmitter response and fiber model. Label it 'Scope filter' or as decided. Change 'Measured waveform' to 'Captured waveform' and make it point between scope filter and fiber model. Could add another label 'Transmitted waveform' between TP2 transmitter response and scope filter.

Response *Response Status* **O**

Cl **68A** SC **68A** P **43** L **14** # **438**

Dawe, Piers — Agilent

Comment Type **E** *Comment Status* **X**

This sentence in brackets looks a lot like repetition, and neither it or its twin seem to be in the right place.

Suggested Remedy

Put a more generic statement of method around p42 line 24, just before the recipe list of actions.

Response *Response Status* **O**

Cl **68A** SC **68A** P **43** L **20** # **439**

Dawe, Piers — Agilent

Comment Type **E** *Comment Status* **X**

Repetition

Suggested Remedy

Shrink to 'For each bit in the data sequence, the equalized input to the slicer is calculated and the probability of error calculated ...'

Response *Response Status* **O**

Cl **68A** SC **68A.1** P **41** L **27** # **440**

Booth, Brad — Intel

Comment Type **E** *Comment Status* **X**

Equation numbers are missing.

Suggested Remedy

Insert equation numbers.

Response *Response Status* **O**

Cl **68A** SC **68A.1** P **41** L **36** # **441**

James, David — JGG

Comment Type **E** *Comment Status* **X**

Wrong symbol.

Suggested Remedy

Replace the multiply dot with an x, as per Style Manual preferences.

Response *Response Status* **O**

Cl **68A** SC **68A.2** P **41** L **48** # **442**

Booth, Brad — Intel

Comment Type **E** *Comment Status* **X**

Paragraph seems to have a line return at the end of the first sentence.

Suggested Remedy

Fix.

Response *Response Status* **O**

Cl **68A** SC **68A.2** P **41** L **49** # **443**

Booth, Brad — Intel

Comment Type **ER** *Comment Status* **X**

SUT needs to be added to 1.5 Abbreviations.

Suggested Remedy

Add SUT to 1.5 Abbreviations.

Response *Response Status* **O**

Cl **68A** SC **68A.2** P **41** L **50** # **444**

Dawe, Piers — Agilent

Comment Type **E** *Comment Status* **X**

10.5 point font should be

Suggested Remedy

10 point

Response *Response Status* **O**

Cl **68A** SC **68A.2** P **42** L **23** # **445**

Booth, Brad — Intel

Comment Type **E** *Comment Status* **X**

Extra carriage return between paragraphs.

Suggested Remedy

Delete.

Response *Response Status* **O**

Cl **68A** SC **68A.2** P **42** L **28** # **446**
James, David JGG

Comment Type **E** *Comment Status* **X**
This list is nonstandard.

Suggested Remedy
First indent should be 'a)', 'b)', etc. Second level indent should be '1)', '2)', etc.

Response *Response Status* **O**

Cl **68A** SC **68A.2** P **42** L **7** # **447**
James, David JGG

Comment Type **E** *Comment Status* **X**
The figure font is nonstandard.

Suggested Remedy
Use 8-point Arial.

Response *Response Status* **O**

Cl **68A** SC **68A.2** P **43** L **16** # **448**
Booth, Brad Intel

Comment Type **E** *Comment Status* **X**
Line spacing seems to be off. Readability is hampered.

Suggested Remedy
Fix.

Response *Response Status* **O**

Cl **68A** SC **68A.2** P **43** L **33** # **449**
James, David JGG

Comment Type **E** *Comment Status* **X**
Bad capitalization.

Suggested Remedy
i.e. ==> I.e.

Response *Response Status* **O**

Cl **99** SC P **1** L **24** # **450**
Grow, Robert Intel

Comment Type **E** *Comment Status* **X**
Awkward break in amendment title

Suggested Remedy
Put ""Type 10GBASE-LRM"" on a new line.

Response *Response Status* **O**

Cl **99** SC P **1** L **32** # **451**
Booth, Brad Intel

Comment Type **E** *Comment Status* **X**
Text is a bit verbose and expiration date shouldn't be past the next revision of the draft.

Suggested Remedy
Change to read: This document specifies the 10GBASE-LRM PMD for serial 10 Gb/s operation using installed, FDDI-grade multimode fiber. The formal expiration of this draft is June 16, 2005.

Response *Response Status* **O**

Cl **99** SC P **1** L **4** # **452**
Booth, Brad Intel

Comment Type **E** *Comment Status* **X**
Font size of TM

Suggested Remedy
Reduce size.

Response *Response Status* **O**

Cl **99** SC P **12** L # **453**
Grow, Robert Intel

Comment Type **E** *Comment Status* **X**
Current publication style does not include a separator title page.

Suggested Remedy
Delete it.

Response *Response Status* **O**

Cl **99** *SC* *P* **2** *L* **1** # **454**

Grow, Robert Intel

Comment Type **E** *Comment Status* **X**

Front matter will be required for Sponsor Ballot. (Front matter is not part of the standard.)

Suggested Remedy

Add more complete front matter (to be supplied by WG Chair) prior to Sponsor Ballot. It would be nice if this was done for at least one WG recirculation.

Response *Response Status* **O**

Cl **99** *SC* **contents** *P* **2** *L* **1** # **455**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

12 point font should be

Suggested Remedy

10 point

Response *Response Status* **O**

Cl **99** *SC* **contents** *P* **2** *L* **1** # **456**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Need a heading. Could also have subheadings 'Changes to existing clauses', 'New clause and annex' but not really worth it.

Suggested Remedy

Insert heading: 'Contents'

Response *Response Status* **O**

Cl **99** *SC* **contents** *P* **2** *L* **14** # **457**

Dawe, Piers Agilent

Comment Type **E** *Comment Status* **X**

Third level entries lack a space or tab between number and title. Also in one case between title and page number.

Suggested Remedy

Fix the template

Response *Response Status* **O**