Cl **00** *SC* **0** *P* *L* # 8
SAYOGO, BARTIEN Individual

Comment Type **G** *Comment Status* **R**

Which number is this amandment?
I suggest that this amandment should cover Cor 1.

SuggestedRemedy

Response *Response Status* **C**

REJECT.

See comment #138.

Yes this amendment is described with reference to IEEE 802.3-2005 and its amendments (as amended by IEEE Std 802.3an-2006, IEEE Std 802.3-2005/Cor 1 and 802.3aq-20xx (when it is approved).

Cl **00** *SC* **0** *P* **0** *L* **0** # 13
DAWE, PIERS J G Individual

Comment Type **G** *Comment Status* **R**

Instructions in this comment form say "Page/Sub-clause/Line Number - These fields are optional. Any data entered must be integers only. No alpha characters or symbols -- doing so will result in an error and the upload will be invalidated. If you wish to reference multiple pages, provide the details in the comment field." Obviously, as we have annexes called A, B and so on, this is not acceptable. I believe it is also not true; some uploads are accepted.

SuggestedRemedy

Action Balloting Center: fix your form! I would have made this a General-Required comment but that would make pain for our volunteer officers who do not control MyBallot.

Response *Response Status* **C**

REJECT.

This comment does not refer to any changes to 802.3ap draft.

The WG chair and 802.3ap Chief Editor have submitted independent bug reports on this issue in myBallot tool. The SA balloting center staff have acknowledged this feedback and they are currently under consideration for the next upgrade.

Cl **00** *SC* **0** *P* **1** *L* **1** # 12
DAWE, PIERS J G Individual

Comment Type **E** *Comment Status* **A**

Various editorial/typographical e.g. inconsistent font sizes in a few diagrams

SuggestedRemedy

See pdf sent to editors

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Fix the editorial/typographical and font sizes as appropriate in clauses 70, 73 and 74.

Cl **00** *SC* **0** *P* **1** *L* **1** # 136
BOOTH, MR BRAD J Individual

Comment Type **ER** *Comment Status* **A**

First use of IEEE P802.3ap should have the trademark symbol.

SuggestedRemedy

Add to first usage and remove from participants list on page 6.

Response *Response Status* **W**

ACCEPT.

Cl **00** *SC* **0** *P* **1** *L* **32** # 138
BOOTH, MR BRAD J Individual

Comment Type **ER** *Comment Status* **A**

Introduction text throughout the draft points out that this is an amendment to 802.3-2005 when it is an amendment to 802.3-2005 and its amendments.

SuggestedRemedy

Change to include "and its amendments".

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

When an amendment or corrigendum is approved, it becomes part of IEEE Std 802.3-2005. Therefore, the name IEEE Std 802.3-2005 implicitly includes amendments and corrigenda.

Add the following text for better clarity:

This draft is an amendment to IEEE Std 802.3-2005 (which by definition includes its approved amendments and corrigendum) and includes new Clauses 69 through 74.

Also see comment #8

Cl **00** *SC* **0** *P* **3** *L* **30** # 234
GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**
Line should end with a colon

SuggestedRemedy
Add colon

Response *Response Status* **C**
ACCEPT.

Cl **00** *SC* **0** *P* **3** *L* **32** # 235
GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**
The publication editor changed this for 802.3an, as all amendments are part of IEEE Std 802.3-2005. Having the separate heading creates the impresion that this isn't true.

SuggestedRemedy
Remove line and make Section descriptions left flush

Response *Response Status* **C**
ACCEPT.

Cl **00** *SC* **0** *P* **4** *L* **35** # 236
GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**
There are no following amendments listed

SuggestedRemedy
Delete the second paragraph of the Editor's Note

Response *Response Status* **C**
ACCEPT IN PRINCIPLE.

Delete the second paragraph of the Editor's Note.

In addition change the sentence after Editor's note to be consistent with 802.3an-2006, as follows:

New Ethernet capabilities are anticipated to be added within the next few years as amendments to this standard.

Cl **00** *SC* **0** *P* **6** *L* **4** # 237
GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**
The Task Force isn't the standard number

SuggestedRemedy
Change "IEEE P802.3ap-200xx" to "P802.3ap"

Response *Response Status* **C**
ACCEPT.

Cl **00** *SC* **0** *P* **6** *L* **26** # 238
GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**
Individuals are not listed at the top and also in the members list.

SuggestedRemedy
Delete all officers and editors listed above the list. Review the list to make sure it is complete as some individuals appear to be missing (column breaks are a possible point).

Response *Response Status* **C**
ACCEPT.

Cl **00** *SC* **0** *P* **15** *L* **26** # 139
BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **R**
Title of annexes are on different lines.

SuggestedRemedy
Remove annex titles or format to be on the same line.

Response *Response Status* **C**
REJECT.

Table of contents will be reformatted at the time of publication.

Cl **00** *SC* **0** *P* **17** *L* **31** # 140
BOOTH, MR BRAD J Individual

Comment Type **ER** *Comment Status* **A**
Missing the date of Cor1.

SuggestedRemedy
Insert 2006 after Cor1.

Response *Response Status* **W**
ACCEPT.

Cl **00** *SC* **0** *P* **17** *L* **31** # 239
GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**
New amendments approved?

SuggestedRemedy
Add 802.3aq and 802.3aq if appropriate per September SASB actions.

Response *Response Status* **C**
ACCEPT IN PRINCIPLE.

Add IEEE Std 802.3aq-2006 and IEEE Std 802.3as-2006.

Update page 4 as well.

Cl **00** *SC* **0** *P* **17** *L* **46** # 240
GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**
802.3an has been approved

SuggestedRemedy
If appropriate per SASB actions: & lost at publication from recently approved amendment projects that modified the same text and tables (e.g., IEEE Std 802.3an-2006 and IEEE Std 802.3aq-2006),

Response *Response Status* **C**
ACCEPT.

Modify the Publication Editor's note as suggested.

Also see response to comment #239.

Cl **01** *SC* **1.4** *P* **18** *L* **9** # 141
BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A**
Missing the period inside the parantheses.

SuggestedRemedy
Change all four definitions to include a period before the closing parantheses.

Response *Response Status* **C**
ACCEPT.

Cl **01** *SC* **1.4** *P* **18** *L* **10** # 222
LAW, DAVID J Individual

Comment Type **E** *Comment Status* **R**
Don't see the value of including subclause 73.5 as part of this reference, subclause 72.6.10.2.2 seems to define DME clearly.

SuggestedRemedy
Change '..72.6.10.2.2 and 73.5)' to read '..72.6.10.2.2)'.

Response *Response Status* **C**
REJECT.

DME signaling is used for training frame in Clause 72 and DME signaling is used for sending Auto-Negotiation pages in Clause 73.

Hence references to both clauses are valid.

Cl **01** *SC* **1.4** *P* **18** *L* **12** # 24
BARRASS, HUGH Individual

Comment Type **E** *Comment Status* **A**
The three MAU types listed should be in alphabetical order.

SuggestedRemedy
The three MAU types listed should be in alphabetical order.

Response *Response Status* **C**
ACCEPT IN PRINCIPLE.

Rearrange the definitions list in 1.4 to be in alphanumeric order.

Cl **30** *SC* **30.3.2.1.3** *P* **18** *L* **38** # 84
LAW, DAVID J Individual

Comment Type **TR** *Comment Status* **A**

Subclause 73.1 states 'It is highly recommended that a device that has negotiated 1000BASE-KX operation through this clause not perform Clause 37 auto-negotiation. If Clause 37 auto-negotiation is performed after this clause's auto-negotiation, then it is highly recommended that the advertised abilities used in Clause 37 match those advertised abilities used in this clause.'
The problem is that these are just recommendations and therefore the standard does permit Clause 73 and Clause 37 Auto-Negotiation to advertise different abilities. If this were to happen the text provides no guidance at to which of the two 'local technology ability' or 'advertised ability' to use.

SuggestedRemedy

Either define which the behaviour of management in the case of both Clause 73 and Clause 37 Auto-Negotiation being active or prohibit this option.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Define the behaviour clearly in subclause 73.1:

"If Clause 37 auto-negotiation is performed after this clause's auto-negotiation, then the advertised abilities used in Clause 37 shall match those advertised abilities used in this clause.

Cl **30** *SC* **30.5.1.1.13** *P* **19** *L* **16** # 223
LAW, DAVID J Individual

Comment Type **E** *Comment Status* **A**

Normally we don't explain the reference in detail and instead place them in the same order as the items they relate to in the text. For an example see subclause 30.4.3.1.15 'aAutoPartitions' which contains the text 'A Clause 27 and Clause 41 repeater port partitions on entry to the PARTITION WAIT state of the partition state diagram (Figure 27-8 and Figure 41-4).;'

SuggestedRemedy

Change the text '(see 65.2 for 1000BASE-PX PHY or see Clause 74 for 10GBASE-R PHY).' to read '(see 65.2 and Clause 74).'.
Perform similar changes for:
Page 19, Line 32
Page 20, Line 7
Page 20, Line 27

Response *Response Status* **C**

ACCEPT.

Cl **30** *SC* **30.5.1.1.13** *P* **19** *L* **16** # 143
BOOTH, MR BRAD J Individual

Comment Type **ER** *Comment Status* **A**

Reference to 10GBASE-R PHY should be plural (PHYs) as there is no indication that this will not work for other 10GBASE-R port types.

SuggestedRemedy

Make the change here and in other locations throughout the draft that reference Clause 74 for 10GBASE-T PHY.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

In 30.5.1.1.13 change first paragraph after "BEHAVIOUR DEFINED AS:" to include clause 74 as follows:

A read-only value that indicates the if the PHY supports the optional FEC Sublayer (see 65.2 and Clause 74).

In 30.5.1.1.14 change first paragraph after "BEHAVIOUR DEFINED AS:" as follows: "A read-write value that indicates the mode of operation of the optional FEC Sublayer (see 65.2 and Clause 74)."

Cl **30** *SC* **30.5.1.1.14** *P* **19** *L* **31** # 3
KAROCKI, PIOTR Individual

Comment Type **E** *Comment Status* **A**

I think this sentence can be written more clearly.
"A read-write value that indicates the mode of operation of the 1000BASE-PX PHY or 10GBASE-R PHY optional FEC Sublayer for forward error correction"
means (if I'm not mistaken)
"A read-write value that indicates the mode of operation of the (1000BASE-PX PHY or 10GBASE-R PHY) optional FEC Sublayer for forward error correction"

SuggestedRemedy

"A read-write value that indicates the mode of operation of the optional FEC Sublayer for forward error correction of either 1000BASE-PX PHY or 10GBASE-R PHY"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #143

Cl **30** *SC* **30.5.1.1.14** *P* **19** *L* **32** # 243

GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**

Missing base text

SuggestedRemedy

There should be a strikethrough "F" next to the inserted "f".

Response *Response Status* **C**

ACCEPT.

Cl **30** *SC* **30.5.1.1.14** *P* **19** *L* **33** # 244

GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**

Looks like there is a new line forced here

SuggestedRemedy

Remove new line.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Refer response to comment #224

Cl **30** *SC* **30.5.1.1.14** *P* **19** *L* **34** # 224

LAW, DAVID J Individual

Comment Type **TR** *Comment Status* **A** *fec_ability*

The last sentence of the first paragraph states 'When Clause 73 Auto-Negotiation is enabled a GET operation maps to the variable FEC enabled in Clause 45 register 7.48'.
[1] This statement appears to be in conflict with the next paragraph which describes the GET operation without conditions and therefore would appear to apply globally.
[2] I thought that the provision of Clause 45 MDIO interface was optional, hence the behaviour has to be described for the situation where the registers do not exist.
[3] The second paragraph states that a SET operation changes the current mode of operation. This would mean that after Auto-Negotiation is complete and FEC has been enabled as described in subclause 73.6.5 'FEC capability' a network manager can happily disable it - although this would not be reflected in a GET operation which since this is to use the result of the Auto-Negotiation.This would not seem the desired behaviour.

SuggestedRemedy

Merge this sentence with the existing second sentence and provide a descript of the behaviour when Clause 45 MDIO is not present. The desired behaviour of the SET operation needs to be decided.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Delete the last sentence from the first paragraph and merge this into the second paragraph as follows:

A GET operation returns the current mode of operation the PHY. A SET operation changes the mode of operation of the PHY to the indicated value. When Clause 73 Auto-Negotiation is enabled a SET operation is not allowed and a GET operation maps to the variable FEC enabled in Clause 74.

Cl **30** *SC* **30.5.1.1.15** *P* **19** *L* **50** # 225

LAW, DAVID J Individual

Comment Type **T** *Comment Status* **R**

The following is the content of the rationale for revision on a maintenance request received from Michael Beck due to the maximum increment rates for this attribute, as well as aFECUncorrectableBlocks, being incorrect.
For 10 Mb/s 10PASS-TS implementations [rate measured at the alpha(beta)-interface], the smallest unit of data to which FEC can be applied, is a block of 128 bytes of data entering the PMA over the alpha(beta)-interface (see 62.2.4.2). Such a block will be coded into 144 bytes at the I-interface. Hence, the maximum number of FEC blocks per second equals:
10,000,000 / (8 * 128) = 9,766
For 1000 Mb/s implementations (rate measured at the GMII), the smallest unit of data to which FEC can be applied, is a single minimum-size data frame (see 65.2.3.2.2). S_FEC (5 bytes), preamble (7 bytes), and SLD (1 byte) are prepended. T_FEC (6 bytes), parity (16 bytes), and T_FEC (6 bytes) are appended. Hence, the maximum number of FEC blocks per second equals:
1,000,000,000 / [8 * (5 + 7 + 1 + 64 + 6 + 16 + 7)] = 1,179,246

SuggestedRemedy

Please consider making the following change:
Change '.. rate of 1 600 000 counts ..' to read '.. rate of 10 000 counts ..' and '.. 500 000 counts per second ..' to read '.. 1 200 000 counts per second ..' in both aFECCorrectedBlocks and aFECUncorrectableBlocks.

Response *Response Status* **C**

REJECT.

The suggested remedy refers to errata in base text that is not being modified by P802.3ap standard.

FEC for P802.3ap is only related to 10Gbps speed which has a rate of 10Gbps/FEC block size of 2112bits = 4734848 = rounded to 5,000,000. This rate is already captured correctly in the text for 30.5.1.1.15 and 30.5.1.1.16.

Hence no change is required in 30.5.1.1.5 or 30.5.1.1.16.

Cl **30** *SC* **30.5.1.1.2** *P* **18** *L* **42** # 142

BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A**

Editor's note is out of date.

SuggestedRemedy

Remove.

Response *Response Status* **C**

ACCEPT.

Cl **30** *SC* **30.5.1.1.2** *P* **18** *L* **44** # 241

GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**

Update Editor's Note.

SuggestedRemedy

This attribute has been modified by IEEE Std 802.3an and IEEE Std 802.3aq, each inserting a MAU type into the list.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Delete Editors note.

Refer response to comment #142.

Cl **30** *SC* **30.5.1.1.2** *P* **18** *L* **50** # 83

LAW, DAVID J Individual

Comment Type **T** *Comment Status* **A**

While there is an objective in subclause 69.1.2 that states 'Support full duplex operation only' I can see nothing in Clause 70 that normatively (or even informatively) states that half duplex operation cannot be support. The addition of the PMD defined in Clause 70 to the Clause 36 PMA/PCS to create a 1000BASE-KX PHY will create a PHY capable of Half-duplex operation. Furthermore while Clause 73 Auto-Negotiation does not support duplex ability negotiation, subclause 73.1 states that, although high not recommended, a different set of abilities can be negotiated by Clause 37 Auto-Negotiation after Clause 73 Auto-Negotiation is complete. This Clause 37 negotiation has to include the duplex ability (see Table 37-1). So a half-duplex 1000BASE-KX seems to be supported.

SuggestedRemedy

Add enumerations for half and full duplex 1000BASE-KX PHY.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

As per objectives defined in 69.1.2 only Full duplex operation is supported for Backplane Ethernet PHYs including 1000BASE-KX.

Add the following paragraph to 70.1 to meet the objective defined in 69.1.2. "The Clause 36 PCS/PMA when used with 1000BASE-KX shall support full duplex operation only."

Hence no enumerations were addded for Half duplex. If Clause 70 does not unambiguously exclude the half duplex operation of 1000BASE-KX PHY, then add text in Clause 70, that clearly outline this objective.

Cl **30** *SC* **30.5.1.1.2** *P* **19** *L* **1** # 242

GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**

I can't make sense of the insert order. This instruction though has the order 10GBASE-SR, 10GBASE-LRM and then 10GBASE-KX.

SuggestedRemedy

I believe all of these inserts are to be in quasi alphanumeric order (grouping all 10 then 100, etc. rather than strict order). Perhaps the insertion point of 10GBASE-LRM is off.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change line 1 as follows:
"Insert 10GBASE-KR before 10GBASE-LR"

Apply the similar change to Annex 30B as well.

Also change the list in 30B.2 in alphabetical order. (Change instructions to "AutoNegTechnology" should be listed first, before "TypeValue").

The grouping in 802.3-2005 subclause 30.5.1.1.2 is not strictly in quasi-alphanumeric order. It is grouped by the PHY types. (For example LX4 is listed above CX4, however this is within the 10GBASE-X group).

Eg. All 10GBASE-R PHY types are grouped and listed together in quasi alphanumeric order. So the placement of LRM could have been after LR.

Cl **30** *SC* **30.6.1.1.10** *P* **22** *L* **10** # 144

BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **R**

Extra punctuation at the end of the sentence.

SuggestedRemedy

Delete the extra punctuation.

Response *Response Status* **C**

REJECT.

The base text in Clause 30 has double punctuation ("period" followed by "semicolon") at the end of each attribute. So this base text is not changed in 802.3ap document.

Cl **30** *SC* **30.6.1.1.3** *P* **20** *L* **36** # 226

LAW, DAVID J Individual

Comment Type **E** *Comment Status* **A**

Typo.

SuggestedRemedy

Suggest that '.. FLP Bursts or /C/ ordered_sets ..' should read '.. FLP Bursts, /C/ ordered_sets ..'.

Response *Response Status* **C**

ACCEPT.

Cl **30** *SC* **30.6.1.1.3** *P* **20** *L* **37** # 25

BARRASS, HUGH Individual

Comment Type **E** *Comment Status* **A**

To be consistent with "FLP bursts" and "/C/ ordered sets" the aAutoNegRemoteSignaling should reflect "DME signals" not "DME pages."

SuggestedRemedy

Change "DME pages" to "DME signals" in line 32 and 37.

Response *Response Status* **C**

ACCEPT.

Cl **30** *SC* **30.6.1.1.5** *P* **20** *L* **49** # 245

GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**

10GBASE T is inserted after Rem Fault also, are these to go before 10GBASE-T? Insert order is quickly becoming a mystery to me, but there appears to be no reason for this order unless it is to be after 10GBASE-T and then it is appended to the sequence.

SuggestedRemedy

Change instruction to: Insert the following entries to "APPROPRIATE SYNTAX:" section, after 10GBASE-T (IEEE Std 802.3an-2006):

Response *Response Status* **C**

ACCEPT.

Cl **30** *SC* **30.6.1.1.5** *P* **21** *L* **5** # 75
BARRASS, HUGH Individual

Comment Type **TR** *Comment Status* **A**

It is redundant to add a new technology ability field for the PAUSE bits as their function is defined by Annex 31A in exactly the same way as the existing PAUSE abilities.

SuggestedRemedy

Delete line 5: "Pause C0C1 Pause bits (C0:C1) as specified in Clause 73"

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Clause 73.6.6 does not redefine the operation of Pause bits, it refers to Annex 29B and Annex 31B for definition and operation.

However the base text in 30.6.1.1.5 does not refer to Pause bits defined in 28B.2 Technology ability bit definitions PAUSE(A5) and ASM_DIR(A6).

Delete the Pause C0C1 bits and instead provide a reference to Annex 28B to FDX APAUSE, FDX SPAUSE and FDX BPAUSE in 30.6.1.1.5.

In addition delete F1 bit in 30.6.1.1.5 (page 21, line 7), repharase the sentence as follows:

"FEC Capable FEC ability as specified in Clause 74"

In 73.6.5 rename F1 bit from "FEC enable" to "FEC requested". (rename all 4 instances of FEC enable referered in 73.6.5)

Cl **30B** *SC* **30B.2** *P* **51** *L* **32** # 161
BOOTH, MR BRAD J Individual

Comment Type **ER** *Comment Status* **A**

Use of the terms "X copper" and "R copper" is confusing.

SuggestedRemedy

Change to be "8B/10B transmission" and "64B/66B transmission", respectively.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Remove the word 'copper' from each of three enumerations to avoid confusion with copper cabling.

Cl **34** *SC* **34** *P* **22** *L* **15** # 246
GROW, ROBERT M Individual

Comment Type **GR** *Comment Status* **A**

I think opening Clause 34 and 44 is the wrong thing to do. As much as possible, Backplane Ethernet should be stand alone, just as we made EFM as much as possible stand alone. Including these changes makes a possible future division of the standard more difficult. Backplane has its own introductory clause.

SuggestedRemedy

Delete the text (I believe it is redundant with text in Clause 69) and move the table with appropriate introductory text to Clause 69.

Response *Response Status* **C**

ACCEPT.

Cl **34** *SC* **34.1** *P* **22** *L* **22** # 145
BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A**

Missing period at end of paragraph.

SuggestedRemedy

Insert period.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Overtaken by events. Refer to comment #246

Cl **44** *SC* **44.1.1** *P* **22** *L* **33** # 76
BARRASS, HUGH Individual

Comment Type **E** *Comment Status* **A**

There is a missing period at the end of the sentence. Also, putting the FEC information in a separate paragraph implies that the FEC sublayer is defined for any 10Gbit PHY.

SuggestedRemedy

Rewrite as:
10 Gigabit Ethernet is also defined for operation over electrical backplanes via the 10GBASE-KX4 and
10GBASE-KR PHY. For additional information on Backplane Ethernet, refer to Clause 69.
An optional FEC sublayer is defined in Clause 74.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Overtaken by events. Refer to comment #246

Cl **44** *SC* **44.1.1** *P* **22** *L* **34** # 146
BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A**
Missing period at end of paragraph.

SuggestedRemedy
Insert period.

Response *Response Status* **C**
ACCEPT IN PRINCIPLE.

Overtaken by events. Refer to comment #246

Cl **44** *SC* **44.3** *P* **22** *L* **41** # 147
BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A**
Correct reference to 802.3an.

SuggestedRemedy
As per comment.

Response *Response Status* **C**
ACCEPT IN PRINCIPLE.

Overtaken by events. Refer to comment #246

Cl **45** *SC* **45.2.1** *P* **23** *L* **14** # 148
BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **R**
Incorrect editing instruction.

SuggestedRemedy
Either use "change" or "insert".

Response *Response Status* **C**
REJECT.

"replace" is an allowed editing instruction. Its use here is in response to a previous comment on the draft.

Cl **45** *SC* **45.2.1.1** *P* **23** *L* **50** # 149
BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A**
Use "Table" instead of "table".

SuggestedRemedy
As per comment.

Response *Response Status* **C**
ACCEPT.

Cl **45** *SC* **45.2.1.1** *P* **24** *L* **5** # 247
GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**
Changes aren't properly marked

SuggestedRemedy
I think it would be better to head these two pseudo columns with the complete bit reference as in Clause 22. Strike through line showing existing headers, add new underscore line with bit headings 1.0.6 and 1.0.13. Center the bit values below those headings. Same for line 10.

Response *Response Status* **C**
ACCEPT.

Cl **45** *SC* **45.2.1.6** *P* **24** *L* **29** # 248
GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**
Unfortunately, this is the way 802.3aq should have been written, but it wasn't in D4.0. Because 802.3an expanded the 11xx values, P802.3aq should be published with that expansion and the 1001 = 10GBASE-T declaration. Changes are properly marked against what published 802.3aq should be, but they aren't against P802.3aq.

SuggestedRemedy
Insert Editor's Note: P802.3aq/D4.0 did not include some 802.3an changes as its base text. These base text updates are expected to be made in the IEEE Std 802.3aq-200x. Below change instruction and table markup that indicate a combination of IEEE Std 802.3an-2006 and P802.3aq/D4.0 assumes the published 802.3aq will include those IEEE Std 802.3an base text updates.
Change instruction to read: Change the reserved descriptions in Table 45-7 (including IEEE Std 802.3an-2006 and P802.3aq/D4.0 changes) as follows. If P802.3aq is not published before P802.3ap then row 1000 should be left as "Reserved".

Response *Response Status* **C**
ACCEPT.

Cl **45** *SC* **45.2.1.7.4** *P* **25** *L* **5** # 249
GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**
P802.3aq/D4.0 doesn't include 10GBASE-T changes

SuggestedRemedy
Change instruction to read: Change the first paragraph of 45.2.1.7.4 (including IEEE Std 802.3an-2006 and P802.3aq/D4.0 changes) as follows. If P802.3aq is not published before P802.3ap then do not add the text "for 10GBASE-LRM serial PMDs in 68.4.8,"

Response *Response Status* **C**
ACCEPT.

Cl **45** *SC* **45.2.1.7.5** *P* **25** *L* **23** # 250
GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**
P802.3aq/D4.0 doesn't include 10GBASE-T changes

SuggestedRemedy
Change instruction to read: Change the first paragraph of 45.2.1.7.5 (including IEEE Std 802.3an-2006 and P802.3aq/D4.0 changes) as follows. If P802.3aq is not published before P802.3ap then do not add the text "for 10GBASE-LRM serial PMDs in 68.4.8,"

Response *Response Status* **C**
ACCEPT.

Cl **45** *SC* **45.2.1.7.8** *P* **25** *L* **23** # 251
GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**
P802.3aq/D4.0 doesn't include 10GBASE-T changes

SuggestedRemedy
Change instruction to read: Change the first paragraph of 45.2.1.7.8 (including IEEE Std 802.3an-2006 and P802.3aq/D4.0 changes) as follows. If P802.3aq is not published before P802.3ap then do not add the text "for 10GBASE-LRM serial PMDs in 68.4.8,".

Response *Response Status* **C**
ACCEPT.

Cl **45** *SC* **45.2.1.7.8** *P* **26** *L* **23** # 252
GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**
P802.3aq/D4.0 doesn't include 10GBASE-T changes

SuggestedRemedy
Change instruction to read: Change the reserved descriptions in Table 45-11 (including IEEE Std 802.3an-2006 and P802.3aq/D4.0 changes) as follows. If P802.3aq is not published before P802.3ap, then row 1.11.1 should be left as "Reserved"

Response *Response Status* **C**
ACCEPT.

Cl **45** *SC* **45.2.1.77** *P* **27** *L* **33** # 150
BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A**
Cross-reference to Table 45-54 is goofed up.

SuggestedRemedy
Fix.

Response *Response Status* **C**
ACCEPT.

Cl **45** *SC* **45.2.1.78** *P* **28** *L* **23** # 151
BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A**
Run-on sentence.

SuggestedRemedy
Change comma after "read only" to be a semi-colon and insert a comma after "however".

Response *Response Status* **C**
ACCEPT.

Cl **45** *SC* **45.2.1.78.3** *P* **29** *L* **5** # 152
BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A**
Double period.

SuggestedRemedy
Search document for double periods and fix.

Response *Response Status* **C**
ACCEPT.

Cl **45** *SC* **45.2.1.8** *P* **26** *L* **23** # 4
KAROCKI, PIOTR Individual

Comment Type **E** *Comment Status* **A**
Why not "ability" (in two rows, 10GBASE-KR and KX4)? Other rows has "ability" word in 'name' column.

SuggestedRemedy
1.11.4 10GBASE-KR ability
1.11.3 10GBASE-KX4 ability

Response *Response Status* **C**
ACCEPT.

also underline 'ability' for 10BASE-T, 100BASE-TX and 1000BASE-T.

Cl **45** *SC* **45.2.1.82** *P* **33** *L* **1** # 5
KAROCKI, PIOTR Individual

Comment Type **E** *Comment Status* **A**
No space in clause title, "(Register1.160)"

SuggestedRemedy
Change to "(Register 1.160)"

Response *Response Status* **C**
ACCEPT IN PRINCIPLE.

also Register 1.161

Cl **45** *SC* **45.2.1.83.1** *P* **34** *L* **34** # 153
BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A**
Missing space between "ability" and "(".

SuggestedRemedy
Fix.

Response *Response Status* **C**
ACCEPT.

Cl **45** *SC* **45.2.1.84.1.1** *P* **36** *L* # 253
GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**
I think this is the first time we have gone six levels deep in subclauses. I believe we already are in violation of the style manual with five.

SuggestedRemedy
I don't see an easy way out, but talk to the publication editor for suggestions.

Response *Response Status* **C**
ACCEPT IN PRINCIPLE.

Delete 45.2.1.84 and Table 45-61 in Draft 3.0

also comment 137

Cl **45** *SC* **45.2.1.84.1.1** *P* **36** *L* **37** # 137
BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A**
Throughout the draft there is use of 6 heading levels. Does this meet the IEEE sytle guide?

SuggestedRemedy
If not, change nesting of headings.

Response *Response Status* **C**
ACCEPT IN PRINCIPLE.

see comment 253

Cl **45** *SC* **45.2.7.10** *P* **44** *L* # 256
GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**
Style, unmarked change

SuggestedRemedy
Use emdash instead of hyphen after NOTE 1 and NOTE 2. The 1 needs to be underscore.

Response *Response Status* **C**
ACCEPT IN PRINCIPLE.

Note 2 has been removed

Cl **45** *SC* **45.2.7.12** *P* **46** *L* **1** # 257
GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**
No renumbering required, insert is at the end of 45.2.7.

SuggestedRemedy
Delete second sentence of instruction.

Response *Response Status* **C**
ACCEPT.

Cl **45** *SC* **45.2.7.6** *P* **40** *L* **43** # 7
MCCLELLAN, MR BRETT A Individual

Comment Type **E** *Comment Status* **A**
It is unclear which parts of this subclause apply only to backplane and which apply to non-backplane devices. For example, does the text on lines 34 to 37 apply to all devices? Do lines 45 to 50 apply to backplane devices? Page 40 line 43 and page 44 lines 9-10 separately describe the use of bit 7.16.12.

SuggestedRemedy
Break 45.2.7.6 into two subclauses, one describing the use of registers 7.16 to 7.18 for backplane and one for non-backplane devices.

Response *Response Status* **C**
ACCEPT IN PRINCIPLE.

see response to comment 97

Cl **45** *SC* **45.2.7.7** *P* **40** *L* **23** # 154
BOOTH, MR BRAD J Individual

Comment Type **ER** *Comment Status* **A**
Editing instruction is confusing and incorrect.

SuggestedRemedy
Move the editing instruction after the heading and change to read "Insert after the heading the following paragraphs:". Delete the unchanged paragraphs or provide an editor's note that these paragraphs are unchanged and are left in so users don't have to reference 802.3an. Before the first note, insert an editing instruction to read "Change Note to be Note 1 as follows:" and show the edits made to the note. Before the 2nd note, insert the editing instruction "Insert the following note:".
Same applies to 45.2.7.10 and its notes.

Response *Response Status* **W**
ACCEPT IN PRINCIPLE.

see response to comment 97

Cl **45** *SC* **45.2.7.7** *P* **40** *L* **26** # 254
GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**
Base text error

SuggestedRemedy
802.3an includes third series comma after 7.17.

Response *Response Status* **C**
ACCEPT IN PRINCIPLE.

See response to comment 7

Cl **45** *SC* **45.2.7.7** *P* **40** *L* **28** # 97

GANGA, ILANGO S Individual

Comment Type **T** *Comment Status* **A**

This register is shared by 802.3an and 802.3ap. The organization of the current text is ambiguous as to which corresponds to 802.3an and which corresponds to 802.3ap.

SuggestedRemedy

To make it clear. Have a separate subclause within 45.2.7.7. (say 45.2.7.7.1 and 45.2.7.7.2) and keep the general changes that are common to 802.3ap and .3an in 45.2.7.7 and move the 802.3an specific changes to 45.2.7.7.1 and move 802.3ap specific changes to 45.2.7.7.2. If moving .3an changes is not feasible, at a minimum have a separate subclause for 802.3ap specific changes. Make similar changes to other shared registers such as AN LP base page ability registers and AN XNP register(s) etc.,

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

This response also covers comments 7, 154, 97 and 156.

Renumber 45.2.7.7, 45.2.7.8, 45.2.7.9 and 45.2.7.10 to:
45.2.7.6, 45.2.7.7, 45.2.7.8 and 45.2.7.9

Rewrite these clauses to make it clear what applies to 802.3an and what applies to 802.3ap.

Remove the detailed bit definitions for the base page and next page registers in Clause 45 and refer to the semantics of the bits to the AN Clause 73 and Clause 28.

Provide editorial license to modify the text appropriately.

Cl **45** *SC* **45.2.7.7** *P* **41** *L* **23** # 255

GROW, ROBERT M Individual

Comment Type **E** *Comment Status* **A**

Style, unmarked change

SuggestedRemedy

Use emdash instead of hyphen after NOTE 1 and NOTE 2. The 1 needs to be underscore.

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.7.7** *P* **41** *L* **30** # 155

BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A**

Change orphan settings on Table 45-137.

SuggestedRemedy

As per comment.

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.7.8** *P* **42** *L* **26** # 156

BOOTH, MR BRAD J Individual

Comment Type **ER** *Comment Status* **A**

Editing instruction is confusing and incorrect.

SuggestedRemedy

Change editing instruction to read "Insert after the heading the following paragraphs:".
Delete the unchanged paragraphs or provide an editor's note that these paragraphs are unchanged and are left in so users don't have to reference 802.3an.
Same applies to 45.2.7.9 and its note.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

see response to comment 7

Cl **45** *SC* **45.5.1** *P* **47** *L* **6** # 258

GROW, ROBERT M Individual

Comment Type **ER** *Comment Status* **A**

Invalid changes to PICS header information. 45.5.1 is included without change marks and I believe it has been decided to delete the similar information from the published 802.3an. When approved, 802.3ap becomes part of 802.3-2005, but 802.3-2005 is not part of 802.3an, so it is not appropriate to update the standard to which you claim to conform. (P802.3ap doesn't have all of the PICS items.)

SuggestedRemedy

Delete 45.5.1 and its subclauses

Response *Response Status* **W**

ACCEPT.

Also see comment #157.

Cl **45** *SC* **45.5.1** *P* **47** *L* **8** # 157
BOOTH, MR BRAD J Individual

Comment Type **ER** *Comment Status* **A**
Clause 45 applies to all of 802.3 and not just 802.3ap.

SuggestedRemedy
Remove 45.5.1 and 45.5.2.

Response *Response Status* **W**
ACCEPT.

Also refer to comment #258.

Cl **45** *SC* **45.5.10.8** *P* **50** *L* **1** # 259
GROW, ROBERT M Individual

Comment Type **ER** *Comment Status* **A**
Bad subclause number

SuggestedRemedy
Change to 45.5.3.8. Make sure change also corrects error on line 18.

Response *Response Status* **W**
ACCEPT.

Cl **45** *SC* **45.5.10.8** *P* **50** *L* **13** # 160
BOOTH, MR BRAD J Individual

Comment Type **ER** *Comment Status* **A**
Naming doesn't match what is used.

SuggestedRemedy
Change to be AN or change AN in 45.5.10.9 to be ABN.

Response *Response Status* **W**
ACCEPT IN PRINCIPLE.

change AM57 feature description to "bit 7.48.0 set to 1"

Cl **45** *SC* **45.5.3.2** *P* **48** *L* **17** # 158
BOOTH, MR BRAD J Individual

Comment Type **ER** *Comment Status* **A**
FEC-R not found.

SuggestedRemedy
Change to be FEC or change other instances of FEC to be FEC-R.

Response *Response Status* **W**
ACCEPT IN PRINCIPLE.

It can't be FEC as there is already a FEC in 45.5.3.16 Clause 22 extension options.

FEC will be changed to FEC-R

Cl **45** *SC* **45.5.3.3** *P* **49** *L* **8** # 159
BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A**
Feature names are too long.

SuggestedRemedy
Change to be shorter.

Response *Response Status* **C**
ACCEPT.

Cl **69** *SC* **69.1.1** *P* **53** *L* **12** # 162
BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A** *x*
Don't use "and/or".

SuggestedRemedy
Change to be "or".

Response *Response Status* **C**
ACCEPT.

Cl **69** *SC* **69.1.1** *P* **53** *L* **19** # 77

BARRASS, HUGH Individual

Comment Type **E** *Comment Status* **R** *x*

Some say that it is a grammatical error to needlessly split an infinitive.

SuggestedRemedy

Change "...segment to automatically select the..."
to "...segment to select automatically the..."

Response *Response Status* **C**

REJECT.

Current text follows the grammatical conventions of other clauses in the document (namely, clause 73).

Cl **69** *SC* **69.1.2** *P* **53** *L* **30** # 85

LAW, DAVID J Individual

Comment Type **E** *Comment Status* **A** *x*

This list of PHY types provided here is not connected with text in this item.

SuggestedRemedy

Suggest that 'Support operation over ..' be changed to read 'Support operation of the following PHY over ..'.

Response *Response Status* **C**

ACCEPT.

Cl **69** *SC* **69.1.3** *P* **54** *L* **11** # 86

LAW, DAVID J Individual

Comment Type **T** *Comment Status* **A** *x*

The LLC is Logical Link Control and is not an 'Other MAC Client'.

SuggestedRemedy

Suggest 'LLC -- LOGICAL LINK CONTROL OR OTHER MAC CLIENT' be changed to read 'LLC (LOGICAL LINK CONTROL) OR OTHER MAC CLIENT'.

Response *Response Status* **C**

ACCEPT.

This will make the diagrams consistent with similar diagrams in IEEE 802.3-2005.

Cl **69** *SC* **69.1.3** *P* **54** *L* **26** # 88

LAW, DAVID J Individual

Comment Type **T** *Comment Status* **A** *x*

Why is just FEC marked as optional, aren't the GMII, XGMII and AN also optional.

SuggestedRemedy

Either remove this designation or be more consistent in the marking of options.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Refer to comment #163.

Cl **69** *SC* **69.1.3** *P* **54** *L* **26** # 163

BOOTH, MR BRAD J Individual

Comment Type **ER** *Comment Status* **A** *x*

XGMII and GMII are also optional.

SuggestedRemedy

Put an asterisk after GMII and XGMII. Change "FEC is optional" to be "Optional".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Remove 'optional' designations from this figure. Table 69-1 clearly designates what is optional and mandatory. With regards to GMII and XGMII, the respective clauses (70, 71, and 72) also cleary designate what is optional and mandatory.

Cl **69** *SC* **69.1.3** *P* **54** *L* **46** # 164

BOOTH, MR BRAD J Individual

Comment Type **ER** *Comment Status* **A** *x*

Item d) and e) have names when used as observable interconnects.

SuggestedRemedy

Change to use TBI and XSBI, respectively.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Change items d) and e) to:

d) The 1000BASE-X PMA service interface, when implemented at an observable interconnection point (TBI), uses the 10-bit-wide data path as specified in Clause 36.
e) The PMA service interface for 10 Gb/s serial, when implemented at an observable interconnection point (XSBI), uses the 16-bit-wide data path as specified in Clause 51.

Cl **69** *SC* **69.2.1** *P* **55** *L* **6** # 79

LAW, DAVID J Individual

Comment Type **E** *Comment Status* **A** *x*

The text 'and the PHY sublayers' seems a bit odd - isn't it only ever to one sublayer - and isn't it the PCS. Clause 46 states 'The purpose of the XGMII is to provide a simple, inexpensive, and easy-to-implement interconnection between the Media Access Control (MAC) sublayer and the Physical layer (PHY).' Suggest similar wording is used here.

SuggestedRemedy

Change '.. and the PHY sublayers.' to read '.. and the PHY.'

Response *Response Status* **C**

ACCEPT.

Cl **69** *SC* **69.2.3** *P* **55** *L* **22** # 165

BOOTH, MR BRAD J Individual

Comment Type **ER** *Comment Status* **A** *x*

Too much information.

SuggestedRemedy

Delete "or sixteen connections".

Response *Response Status* **W**

ACCEPT.

Cl **69** *SC* **69.2.3** *P* **55** *L* **37** # 184

BAUMER, HOWARD A Individual

Comment Type **ER** *Comment Status* **A** *x*

Table 69-1 is missing a column for Clause 73. Since Clause 73 Is manditory for each of the Nomenclatures it should be added into the table with the other realted clauses.

SuggestedRemedy

Add a column for Clause 73 and mark it as "M" for each of nomenclature row

Response *Response Status* **C**

ACCEPT.

Cl **69** *SC* **69.2.4** *P* **56** *L* **13** # 6

KAROCKI, PIOTR Individual

Comment Type **E** *Comment Status* **A** *x*

Two dots after "Clause 73".

SuggestedRemedy

Response *Response Status* **C**

ACCEPT.

Cl **69** *SC* **69.3** *P* **56** *L* **40** # 166

BOOTH, MR BRAD J Individual

Comment Type **ER** *Comment Status* **A** *x;kx_delay*

The numbers don't work with what's in 36.5.1, as that number includes the PMD.

SuggestedRemedy

Move the PMD number into the PCS/PMA number to make it equal the 36.5.1. Insert a delay number for the backplane media.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Delete the '1000BASE-KX PMD' row, and relabel the row '1000BASE-X PCS and PMA' as '1000BASE-KX PCS, PMA, and PMD'. Add row 'Medium' with a value of 16 bit times (see below for derivation).

Strike the first sentence of note (a) of Table 69-2.

Note: Update KR PMD delay as per comment #230.

Add a note to Table 69-3 that states the medium delay is included in the PMD delay.

In the course of responding to this comment, the editor has developed some concerns with the media delay assumptions and would like them to be considered again.

Assuming a delay of 150 to 180 ps/in for a printed circuit board trace, the delay for a 1 m backplane would be approximately 6 to 7 ns. The assumed delay is on this order (8 ns) for both 1000BASE-KX (8 bit times) and 10GBASE-KR (80 bit times).

However, for 10GBASE-KX4, the assumed delay is 20 bit times. The bit time is defined to be the inverse of the bit rate at the MAC service interface, which means the assumed propagation delay is 2 ns, or a quarter of what is allocated for the other two PHYs. The delays should be identical.

In addition, the delay relevant to these tables should be the round trip delay, so it would be more appropriate to state that the round-trip delay is assumed to be 16 bit times for 1000BASE-KX and 160 bit times for 10GBASE-KX4 and 10GBASE-KR.

Update clauses 70, 71, 72 with correct medium delays.

Cl **69** *SC* **69.3** *P* **57** *L* **21** # 230

GHIASI, ALI Individual

Comment Type **TR** *Comment Status* **A** *x*

PMD delay may be too short in some implementation

SuggestedRemedy

Increase the delay from 512 bits to 1024 bits, insignificant increase to other delays

Response *Response Status* **C**

ACCEPT.

See also comment #166.

Cl **69** *SC* **69.4** *P* **57** *L* **26** # 227

LAW, DAVID J Individual

Comment Type **T** *Comment Status* **A** *x*

I would like it made very clear that in the case of conflict the State Machine takes precedence.

SuggestedRemedy

Suggest this reads 'In the case of any ambiguity between the text and the state diagrams, the state diagrams shall take precedence.'

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change to:

'In the case of any ambiguity between the text and the state diagrams, the state diagrams take precedence.'

Cl **69A** *SC* **69A** *P* **184** *L* **1** # 210

BAUMER, HOWARD A Individual

Comment Type **TR** *Comment Status* **R** *x;normative_channel*

This is a comment against Annex 69A. This comment is dependent upon changing Annex 69B from informative to normative for all PMD types and changing the acceptance of comments against Clause 70,71,72 specifying their recievers meeting BER requriements when connected to a compliant transmitter through a compliant channel
If the above paragraph becomes true then this annex is no longer needed

SuggestedRemedy

Remove Annex 69A from document

Response *Response Status* **U**

REJECT.

Per the response to comment 16 the consensus of the task force is that the channel remain informative and hence Annex 69A must remain.

Cl **69A** *SC* **69A.2** *P* **184** *L* **40** # 263

GHIASI, ALI Individual

Comment Type **TR** *Comment Status* **A** *x*

Inteference tolerance test only defines frequncy dependent attenuator where the group delay may be flat and not dispersive like FR4 material

SuggestedRemedy

Either define group delay property or the impulse response for the frequncy dependent attenuator.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Throughout IEEE 802.3-2005, the phase response, or group delay, property of electrical cabling and PCB trace is unspecified and only the magnitude property is bounded.

This may be attributable to the fact that the magnitude and phase responses of a real, causal system have a specific relationship.

However, it may be prudent to include a statement (p. 185, l. 38) such as:

'The frequency dependent attenuator is recommended to be constructed in such a way that it accurately represents the insertion loss and group delay characteristics of differential traces on an FR-4 printed circuit board.'

This would discourage testers from crafting exotic frequency dependent attenuator functions that meet the requirements of 69A.2.2 but are not representative of differential traces on FR-4 printed circuit boards.

Cl **69A** *SC* **69A.2.1** *P* **185** *L* **10** # 62

HEALEY, ADAM B Individual

Comment Type **E** *Comment Status* **A** *x*

While "rise time" is a well understood term, this quantity is referred to as "transition time" throughout the document.

SuggestedRemedy

Change "rise time" to "transition time" to be consistent.

Response *Response Status* **C**

ACCEPT.

Cl **69A** *SC* **69A.2.1** *P* **185** *L* **13** # 63

HEALEY, ADAM B Individual

Comment Type **T** *Comment Status* **A** *x*

72.7.2.2 (and comparable sections for the other PHY types) indicates the "10GBASE-KR receiver shall comply with the requirements for Table 72-9 for any signaling speed in the range 10.3125 GBd +/- 100 ppm". This test defines a specific offset (200 ppm relative to the DUT reference clock). These two statements are at odds unless one assumes the +200 ppm offset covers all the cases of +/- 100 ppm. At best, the statement is redundant.

SuggestedRemedy

Strike the text requiring a +200 ppm offset.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

In 69A.2.1 line 13

change "The signaling speed of the pattern generator shall be offset 200 ppm above the reference clock of the DUT."

to "The signaling speed of the pattern generator shall be offset +/-100 ppm relative to the nominal signaling speed of the port type under test."

Cl **69A** *SC* **69A.2.1** *P* **185** *L* **17** # 49

HEALEY, ADAM B Individual

Comment Type **TR** *Comment Status* **A** *x*

The half-power constraint applied to the pattern generator jitter source is poorly connected to the jitter constraints applied to compliant transmitters. The power of a sinusoid of peak amplitude A_DJ is 0.5*A_DJ^2. The power of Gaussian noise with peak value, at 1E-12, of A_RJ is (A_RJ/7.03)^2. Since, for all of the PHYs defined in IEEE P802.3ap, the worst-case transmitter has A_DJ and A_RJ of the same order, the DJ contribution to the total jitter power is approximately 25 times larger than the RJ contribution. In the worst case, if the tester elects to split the jitter power in half, the required peak RJ, at 1E-12, would exceed 0.5 UI.

SuggestedRemedy

Define the (minimum) peak sinusoidal jitter and RMS random jitter (or peak value at the target BER) to be applied by the pattern generator for each PHY covered by the test procedure. Use the respective transmitter requirements as the basis for minimum requiremed values. Delete lines stating that "The sinusoidal jitter plus the duty cycle distortion shall account for at least 50% of the total jitter power" and "The RMS amplitude of the jitter shall be no less..." State that the duty cycle distortion, sinusoidal jitter, and random jitter shall be no less than the values specified for the PHY type being tested. Using 10GBASE-KR for example, in Table 72-10, the field "Applied Jitter (RMS)" would be removed, with the accompanying text (including Equation 72-10) removed. Two new fields would be added: "Applied sinusoidal jitter (min)" with units of "UIpk-pk" and value of 0.115, and "Applied random jitter (min)" also with units "UIpk-pk" and value of 0.130 with a note indicating that "applied random jitter is specified at a BER of 1E-12". Finally, the parameter "Minimum DCD jitter" would be renamed "Applied duty cycle distortion (min)" for consistency, with units of "UIpk-pk" and value of 0.035. The total applied jitter would therefore be no less than 0.28 UIpk-pk, with emphasis places on the sinusoidal jitter assuming that it is more stressful than the random jitter. Additional editorial changes to provide a consistent labeling include renaming the following parameters: "Amplitude of broadband noise (RMS)" should become "Amplitude of broadband noise (min)" with units "mVrms", "Minimum transition time" should become "Transition time (20%,-80%, min) with units of "ps". Similar changes would be applied to 1000BASE-KX and 10GBASE-KX4 test requirements.

Response *Response Status* **C**

ACCEPT.

Cl **69A** *SC* **69A.2.1** *P* **185** *L* **7** # 100

VALLIAPPAN, MAGESH Individual

Comment Type **GR** *Comment Status* **A** *x;kr_minoutput*

When running EIT simulations, it was assumed (at least by me) that 800mVpp would be observed with an alternating ones/zeros pattern. This guarantees a minimum transmit energy at 5GHz, even with slow rise times.

SuggestedRemedy

Change text to - For 10GBASE-KR, the peak-to-peak amplitude delivered by the pattern generator shall be no more than 800 mV, adjusted by a gain bTC as defined in 69A.2.2, regardless of equalization setting.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Discussion with the commenter indicated that the change text intended was:

'For 10GBASE-KR, the peak-to-peak amplitude delivered by the pattern generator shall be no more than 800 mV for a 1010 pattern, adjusted by a gain bTC as defined in 69A.2.2, regardless of equalization setting.'

This is consistent with the definition of peak-to-peak amplitude in 72.7.1.4.

Cl **69A** *SC* **69A.2.1** *P* **185** *L* **8** # 232

THALER, PATRICIA A Individual

Comment Type **TR** *Comment Status* **A** *x;kr_minoutput*

The specifications of the 1000BASE-KX and 10GBASE-KX4 transmitters are clearly based on the minimum signal specified for their PHYs. It isn't clear that the 10GBASE-KR signal generator is. The current text in 72.6.10.4.2 appears to require the ability to put out a signal higher than 800 mV peak-to-peak. That text has a problem on which I submitted another comment.

SuggestedRemedy

Change the requirement for 10GBASE-KR signal generator to more closely reflect the lowest maximum level the PHY is required to support out of its transmitter.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolution of comment #229 resolves this issue.

Cl **69A** *SC* **69A.2.2** *P* **185** *L* **36** # 50

HEALEY, ADAM B Individual

Comment Type **T** *Comment Status* **A** *x*

The requirements for the interference generator are completely specified in 69A.2.3 and the sentence: "It should be capable of injecting differential interference large enough to cause a BER of at least 1E-4." is no longer necessary.

SuggestedRemedy

Delete the sentence.

Response *Response Status* **C**

ACCEPT.

Cl **69A** *SC* **69A.2.3** *P* **186** *L* **21** # 211

BAUMER, HOWARD A Individual

Comment Type **TR** *Comment Status* **A** *x*

This is a comment against Annex 69A. .
The filter used to measure the noise power from the interfernece generator is specified with to precise of values.

SuggestedRemedy

Change the last sentence of the paragraph to read:
The filter for this measurement shall have at most a 40 dB/decade roll-off and a 3 dB cut-off frequency of at least 0.5 times the signaling speed.

Response *Response Status* **C**

ACCEPT.

Cl **69B** *SC* **69B** *P* **187** *L* **3** # 183

KIM, YONGBUM Individual

Comment Type **TR** *Comment Status* **R** *x;normative_channel*

There has never been a 802.3 PHY standard that has not assured interoperability. Transimiter and receiver spec without a channel specification that allows a system to be qualified as conformant or not conformant will not guarantee interoperability. If this requirement is not met, PAR may need to be revisited on the basis that interoperability criteria has not been met.

SuggestedRemedy

Change "informative" to "normative", and make any necessary corrections in the draft standard to be consistent.

Response *Response Status* **W**

REJECT.

Refer to comment #16.

Cl **69B** *SC* **69B** *P* **187** *L* **3** # 133

FRAZIER, JR., HOWARD M Individual

Comment Type **TR** *Comment Status* **R** *x;normative_channel*

Annex 69B must be made normative. There is no normative specification of the interconnect characteristics for the PHYs defined in this draft, either incorporated in the draft or by reference to an external standard. A normative specification of the interconnect characteristics is essential for interoperability between components from different manufacturers. We should not depend on some unspecified body to provide a normative specification in the future, and we cannot reference a non-existent document.

SuggestedRemedy

Make Annex 69B normative. Reword all "it is recommended" sentences in Annex 69B to be "shall" statements. Add PICS for Annex 69B.

Response *Response Status* **W**

REJECT.

Refer to comment #16.

Cl **69B** *SC* **69B.2** *P* **187** *L* **18** # 212

BAUMER, HOWARD A Individual

Comment Type **TR** *Comment Status* **A** *x*

This is a comment against Annex 69B.
Return loss and insertion loss deviation are missing from the list of informative characteristics and mehods

SuggestedRemedy

Change "for the insertion loss, crosstalk, " to "for the insertion loss, insertion loss deviation, return loss, crosstalk, "
and on line 22 "defined in 69B.4.3, 69B.4.6, " to " defined in 69B.4.3, 69B.4.4, 69B.4.5, 69B.4.6, "
and on line 47 of page 191,

Response *Response Status* **C**

ACCEPT.

Cl **69B** *SC* **69B.3** *P* **187** *L* **47** # 65

HEALEY, ADAM B Individual

Comment Type **E** *Comment Status* **A** *x*

Consistent use of terminology.

SuggestedRemedy

Change "minimum rise time" to "minimum transition time".

Response *Response Status* **C**

ACCEPT.

Cl **69B** *SC* **69B.4** *P* **188** *L* # 16

MCCLELLAN, MR BRETT A Individual

Comment Type **TR** *Comment Status* **R** *x;normative_channel*

Submitted on behalf of Chris DiMinico.
To ensure interoperability channel parameters are typically normatively specified and included in the performance implementation conformance statement (PICS). The channel parameters are identified, in part, to enable appropriate tests against by which to assess the claim for conformance of the implementation. The PICS for Clauses 70, 71 and 72 (802.3ap-200x) do not include channel parameters and/or appropriate specifications/tests to ensure interoperability.
Annex 69B provides informative interconnect characteristics for differential, controlled impedance traces up to 1 m, including two connectors, on printed circuit boards residing in a backplane environment. Although Annex 69B states that the interconnect characteristics can be applied to a specific implementation of the full path (including transmitter and receiver packaging and supporting interaction of these components, the interconnect characteristics are not normatively specified and more importantly are not directly tied to appropriate tests (PICS) to ensure interoperability.
Recognizing that a backplane interconnect is highly dependent on implementation and the need to enable system trade-offs for the designer, a
subset of draft 2.4 channel parameters may be sufficient to ensure interoperability.

SuggestedRemedy

Clause: 69B
Page 188
Line: 3
Change informative to normative.
Add shall statements to the channel parameters necessary to enable appropriate tests by which to assess the claim for conformance of the implementation. Include those channel parameters in the Clauses 70, 71 and 72 (802.3ap-200x) PICS and/or appropriate specifications/tests to ensure interoperability.
Subclause: 69B.4.6.4
Page 195: Line 16.
Replace: It is recommended that ICRfit, offset by PILD and PSYS, be greater than or equal to ICRmin as defined in Equation (69B-26).
With: ICRfit, offset by PILD and PSYS, shall be greater than or equal to ICRmin as defined in Equation (69B-26).
Subclause: 69B.4.5.
Page 192: Line 28:
Replace: It is recommended that the channel return loss, RL, measured in dB at TP1 and TP4, be greater than or equal to RLmin&.
With: The channel return loss, RL, measured in dB at TP1 and TP4, shall be greater than or equal to RLmin as defined in Equations (69B-12), (69B-13), and (69B-14).
Subclause: 69B.4.4.
Page 191: Line 34
Replace: It is recommended that ILD be within the high confidence region defined by Equation (69B-10) and Equation (69B-11):
With: The ILD shall be within the high confidence region defined by Equation (69B-10) and Equation (69B-11):

Response *Response Status* **W**

REJECT.

After significant discussion on this topic, the following strawpoll was taken.

Strawpoll #2:

Should the channel be normative?: 3
Should the channel be informative?: 14

1. Multiple system vendors expressed their preference to keep the channel informative. Many of these systems are currently closed systems and are not independently verified by a third party authority. There is concern that making the channel normative would limit otherwise available degrees of freedom and unnecessarily constrain implementations.

2. The current approach taken by IEEE P802.3ap is consistent with other Clauses, for example XAUI (Clause 47).

3. The informative recommendations for channel performance in Annex 69B supply guidance for users of the standard regarding what backplane channels are interoperable with compliant devices. This implies a linkage between these recommendations and the performance targets enforced via the interference tolerance test (Annex 69A).

4. The specification for open-backplane systems will originate from other organizations such as PICMG. Just as enterprises build generic cable plants to ISO or TIA specifications (not necessarily IEEE specifications), organizations that define open backplane specifications will define the connectors, pin-outs, and performance requirements for systems bearing those respective labels. It is expected that such organizations will base such requirements on the IEEE P802.3ap informative recommendations to ensure compatibility with compliant Backplane Ethernet devices.

Cl **69B** *SC* **69B.4** *P* **188** *L* **1** # 214

BAUMER, HOWARD A Individual

Comment Type **TR** *Comment Status* **R** *x;normative_channel*

This is a comment against Annex 69B.
The purpose of a standard is to ensure a system will opperate when seperately manufactured compomemts are combined to construct the system. This interopperability requirement for a standard can only be ensured if each of the system comonents are fully specified. Only when each piece is fully specified can someone assembling the system from seperately manufactured componets be assured the resultant system will work.
This draft has broken down the system into thre separate and distict components, each one which can come from a multitude of different vendors. These three components are: The transmitter, the backplane channel and the receiver. Each of these components has its limitations on how it can be tested and therefor on how it should be specified. In order to test a component it has to be both able to be controlled and the affects of that controll have to be able to be observed.
The transmitter is very easily controlled and observed. The nature of the transmitter is to give it digital data of "1"s and "0"s and have it produce a waveform that can be applied to the channel. The transmitter by its mere nature is easily controlled and the results observed. A specification for the transmitter has already been drafted taking advantage of its nature.
The channel is also a component that is easily controlled and the affects of that control observerd. Each end of the channel is exposed whereby test equiptment can be made to inject signals into it, control, and observe the signals at the output end, observed. The beginings of a specification for the channel have been started, however, the task force has ellected not to make it manditory that an 802.3ap system meet these, or any, channel specifications.
Although the reciever is very easily controlled, its inputs are redily available to stimulate with test signals, it is very dificult to observe. Even if the receiver specification is encumbered with internal nodes exposed for test purposes the fact is the function of the reciever is to take the incoming signals and turn them into digital "1"s and "0"s. This function alone means the only way to observe the final results of the reciever's function is to count how many times it functions properly. This is called Bit Error Ratio, BER.
The current specification for the reciever measures the receivers performance by measureing the BER it produces for a vastly reduced subset of channels as recommened by this Annex. The interference tollerance test only requires a lossy channel with near perfect return loss (no return loss) and lumps all external noise affects into one lump sum of AWGN. All this test does is show that a particular receiver will recover data and the expeceted BER for that one test channel in the presence of AWGN.
The only real way to guarantee a system will work is to require that the receiver recover data at the targeted BER when a compliant transmitter is transmitting a signal through a compliant channel. Since there is no compliant channel this cannot be done.

SuggestedRemedy

Change Annex 69B from informative to normative. Change all recommended phrases to shall phrases and add appropriate pics section.

Response *Response Status* **U**

REJECT.

Refer to comment #16.

Cl **69B** *SC* **69B.4** *P* **188** *L* **1** # 215

BAUMER, HOWARD A Individual

Comment Type **TR** *Comment Status* **A** *x;budget_closure*

This is a comment against Annex 69B.
When the informative channel models are taken as normative the link budget is not closed. That is there are a significant number of false positives. From the May 3, 2006 channel ad hoc teleconference valliappan_c2_0506.pdf, column 7 shows peters_B12,1,20,M1,20 & DAmbrosia_6T channels as meeting BER targets. From the May06 interim mellitz_01_0506.pdf, slide #8 shows Peters_B12,1,20,M1,20 & SAmbrosius_1,2,3,4,5,7T channels passing the recommended channel limits. This takes into acount adjusting the maximum transmit aplitude and minimum transmit equalization per villiappan_c2_0506.pdf. The link budget needs to be closed, (i.e. no known false positives).

SuggestedRemedy

Adjust the channel parameters such that ther are no known false positive channels. A presentation will be provided during the Sep06 interim with suggested changes.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

refer to comment 15

ICRmin modified to close link budget

Cl **69B** *SC* **69B.4** *P* **188** *L* **1** # 213

BAUMER, HOWARD A Individual

Comment Type **TR** *Comment Status* **R** *x;freq_range*

This is a comment against Annex 69B.
The frequency ranges for the different recommended channel parameters are inconsistant. There are two main reasons for a set of channel parameters. The first is so a vendor of a channel has a set to specifications bywhich they can check their channel against to see if they are meeting the recommendations. The second is so a systems analysist and architect can build a model that they can use to design their receiver to opperate with. It is this later reason the drives the need for consistant frequency ranges for all of the channel parameters.

SuggestedRemedy

Pick one set of frequency ranges to use for all channel parameters per PMD type.

Response *Response Status* **U**

REJECT.

Channel parameters should be specified over a frequency range representing the occupied bandwidth of the PHY of interest. The occupied bandwidth can be related to the signaling speed and the minimum transition time of the PHY. The cases relevant to IEEE 802.3ap are:

1000BASE-KX: fs = 1.25 Gbd, Tr (min) = 60 ps
10GBASE-KX4: fs = 3.125 Gbd (per lane), Tr (min) = 60 ps
10GBASE-KR: fs = 10.3125 Gbd, Tr (min) = 24 ps

Using 10GBASE-CX4 as a benchmark example, the channel parameters are specified to 2000 MHz, which is 0.64 times the signaling rate. It can be shown that approximately 94% of the signal power (assuming the -CX4 minimum recommended transition time of 60 ps) is below this frequency.

For 1000BASE-KX, it can be shown that 94% of the signal power is below 0.85 times the signaling rate.

For 10GBASE-KR, it can be shown that 94% of the signal power is below 0.61 times the signaling rate.

Based on these metrics, a singular frequency range (f1, f2) for all channel parameters may be proposed for a given PHY type.

1000BASE-KX: 100 MHz to 1250 MHz (1.00)
10GBASE-KX4: 100 MHz to 2000 MHz (0.64)
10GBASE-KR: 50 MHz to 6600 MHz (0.64)

However changing the frequency range would require significant modification to the definitions of the channel parameters and limits. It is the concensus of the group that the frequency ranges defined serve the purpose of the Annex and no changes are necessary.

Note that the current frequency ranges are a superset of the minimum required ranges defined above.

Cl **69B** *SC* **69B.4.1** *P* **188** *L* **11** # 17

MCCLELLAN, MR BRETT A Individual

Comment Type **T** *Comment Status* **R** *x*

Submitted on behalf of Chris DiMinico.
The range of frequencies over which the insertion loss parameters are specified (channel bandwidth) for each port type should be related to the port type signaling speed (signal bandwidth) or a rationale (technical justification) to characterize the channel bandwidth beyond the signal bandwidth should be provided. Why does fmax=15 GHz apply to all port types, e.g., KX,KX4 and KR. Why is the KR channel characterized to fmax=15 GHz?
In addition, it would be helpful to have a single range of frequencies for the insertion loss parameter specifications for each port type or provide the rationale (technical basis) for the three different frequency ranges. Draft 2.4 includes channel parameters specified over three different frequency ranges (fmin to fmax), (f1 to f2), and (fa to fb).
Summary Draft 3.0
1. IL(f) and the A(f) ILD allowance are specified from fmin to fmax
2 Amax(f) frequency range is not explicitly specified.
3. ICR(f) - is specified from fa to fb
4. A(f) is specified from f1 to f2.
5. ILD(f) is specified from f1 to f2. For frequencies from f2 to fmax the ILD is bounded by ILmax(f).

SuggestedRemedy

1. Delete fmin parameter: Table 69B-1
2. Delete fmax parameter: Table 69B-1
3. Select either (f1 to f2) or (fa to fb) to reconcile ambiguity in frequency ranges for the insertion loss parameters (including Amax).
4. Limit the channel frequency specification range (f1 to f2 or fa to fb) to the required signal bandwidth for each port type.

Response *Response Status* **C**

REJECT.

Refer to comment 213.

Cl **69B** *SC* **69B.4.1** *P* **188** *L* **14** # 64

HEALEY, ADAM B Individual

Comment Type **E** *Comment Status* **A** *x*

Consistent use of terminology.

SuggestedRemedy

Change "The maximum attenuation" to "The maximum fitted attenuation"

Response *Response Status* **C**

ACCEPT.

Cl **69B** *SC* **69B.4.1** *P* **188** *L* **14** # 67

HEALEY, ADAM B Individual

Comment Type **E** *Comment Status* **A** *x*

Return loss did not appear to make this list.

SuggestedRemedy

Add sentence "The minimum return loss (RL) is defined in 69B.4.5." between ILD and ICR sentences.

Response *Response Status* **C**

ACCEPT.

Refer to comment #216.

Cl **69B** *SC* **69B.4.1** *P* **188** *L* **16** # 216

BAUMER, HOWARD A Individual

Comment Type **TR** *Comment Status* **A** *x*

This is a comment against Annex 69B.
A reference to the recommended return loss is missing from the list of parameters.

SuggestedRemedy

Insert the followinf sentence as the fourth sentence in the indicated paragraph:
The minimum return loss (Rlmin) is defined in 69B.4.5.

Response *Response Status* **C**

ACCEPT.

Cl **69B** *SC* **69B.4.1** *P* **188** *L* **19** # 66

HEALEY, ADAM B Individual

Comment Type **E** *Comment Status* **A** *x*

"To enable system trade-offs for the designer a series of confidence curves have been created for the different parameters" is no longer true. Each parameter has as single delimiting curve partitioning the high confidence region. There is no curve family.

SuggestedRemedy

Delete the sentence. Merge the second sentence of the affected paragraph with the paragraph above.

Response *Response Status* **C**

ACCEPT.

Cl **69B** *SC* **69B.4.1** *P* **188** *L* **3** # 135

FRAZIER, JR., HOWARD M Individual

Comment Type **TR** *Comment Status* **A** *x;budget_closure*

The worst case link budgets for each of the PHYs, operating on a worst case channel, must close. There cannot be corner conditions under which a compliant pair of PHYs, operating on a compliant channel, do not interoperate.

SuggestedRemedy

Change the channel characteristics, and if necessary the input and output characteristics of the PHYs, so that the link budget closes under all worst case conditions.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

refer to comment 15

ICRmin modified to close link budget

Cl **69B** *SC* **69B.4.2** *P* **189** *L* **21** # 217

BAUMER, HOWARD A Individual

Comment Type **ER** *Comment Status* **A** *x*

This is a comment against Annex 69B.
Frequency limits for recommended Amax limit are missing causing confusion over which frequency range Amax should be compared against.

SuggestedRemedy

Add "for f1 <= f <= f2" as part of equation 69B-6 following the convention used for the other channel charateristics.

Response *Response Status* **C**

ACCEPT.

Cl **69B** *SC* **69B.4.2** *P* **189** *L* **23** # 68

HEALEY, ADAM B Individual

Comment Type **E** *Comment Status* **A** *x*

The paragraph starting with "In addition, it is recommend that" is unnecessary. Just with any other section of the document, a "compliant" system must meet all of the applicable requirements there is no need to emphasize this point at the end of each subclause. One reason not to do this evident in this paragraph since the return loss requirements that were subsequently added Annex 69B are not accounted for here despite the fact that the document recommends that those requirements are met also.

SuggestedRemedy

Delete the sentence, and corresponding sentences in 69B.4.3 and 69B.4.4.

Response *Response Status* **C**

ACCEPT.

Cl **69B** *SC* **69B.4.2** *P* **189** *L* **24** # 218

BAUMER, HOWARD A Individual

Comment Type **TR** *Comment Status* **A** *x*

This is a comment against Annex 69B.
Return loss is missing from the list of parameters

SuggestedRemedy

change "& defined in 69B.4.4, and the &" to "& defined in 69B.4.4, the return loss defined in 69B.4.5, and the &"
Make this same change at line 46

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

overtaken by events, refer to comment 68

Cl **69B** *SC* **69B.4.3** *P* **189** *L* # 19

MCCLELLAN, MR BRETT A Individual

Comment Type **T** *Comment Status* **A** *x;overlap_region*

Submitted on behalf of Chris DiMinico.
Please clarify high confidence region. Is it bounded by ILmax or Amax?
I'm assuming ILmax.

SuggestedRemedy

Either remove text "high confidence region" or remove Amax in Figure 69B-2, 69B-3, and 69B-4

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Refer to comment #111.

Cl **69B** *SC* **69B.4.3** *P* **190** *L* # 18

MCCLELLAN, MR BRETT A Individual

Comment Type **T** *Comment Status* **R** *x;freq_range*

Submitted on behalf of Chris DiMinico.
The range of frequencies over which the insertion loss parameters are specified (channel bandwidth) for each port type should be related to the port type signaling speed (signal bandwidth) or the rationale (technical justification) to characterize the channel bandwidth beyond the signal bandwidth should be explicitly provided.

SuggestedRemedy

Limit the channel frequency specification (channel bandwidth) ranges plotted in Figure 69B-2, 69B-3, and 69B-4 to the required signal bandwidth for each port type (f1 to f2 or fa to fb).

Response *Response Status* **C**

REJECT.

Refer to comment #213.

The frequency ranges were not changed.

Cl **69B** *SC* **69B.4.3** *P* **190** *L* **12** # 219

BAUMER, HOWARD A Individual

Comment Type **E** *Comment Status* **A** *x;overlap_region*

This is a comment against Annex 69B.
The "high confidence region" label for the three figures graphically depicting the insertion loss and maximum attenuation can be a little bit confussing. This confusion arrises from having two "limit lines" on one graph yet only one "high confedence region" label.

SuggestedRemedy

Two possible solutions are:
1) Double the number of figures so that there would only be one limit line per figure.
2) Add wording to the "high confidence region" note to the affect of: Amax high confidence rigion is the all of the area above the Amax line, ILmax high confidence region is the all of the area above the IImax line.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Refer to comment #111.

Cl **69B** *SC* **69B.4.3** *P* **190** *L* **28** # 112

FRAZIER, JR., HOWARD M Individual

Comment Type **TR** *Comment Status* **A** *x;overlap_region*

The "High Confidence Region" in Figure 69B-3 is unclear because two curves are present.

SuggestedRemedy

Either 1) use separate figures for Amaz and IImax, or 2) shaded or cross-hatch the figure so that the high confidence regions for Amax and IImax can be readily discerned.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Refer to comment #111.

Cl **69B** *SC* **69B.4.3** *P* **190** *L* **3** # 111

FRAZIER, JR., HOWARD M Individual

Comment Type **TR** *Comment Status* **A** *x;overlap_region*

The "High Confidence Region" in Figure 69B-2 is unclear because two curves are present.

SuggestedRemedy

Either 1) use separate figures for Amaz and IImax, or 2) shaded or cross-hatch the figure so that the high confidence regions for Amax and IImax can be readily discerned.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Amax will be removed from 69B-2, 69B-3 and 69B-4 and will be shown in its own figure. Given that each figure will contain a single limit line the high confidence region will be easily discerned.

Cl **69B** *SC* **69B.4.3** *P* **191** *L* **3** # 113

FRAZIER, JR., HOWARD M Individual

Comment Type **TR** *Comment Status* **A** *x;overlap_region*

The "High Confidence Region" in Figure 69B-4 is unclear because two curves are present.

SuggestedRemedy

Either 1) use separate figures for Amaz and IImax, or 2) shaded or cross-hatch the figure so that the high confidence regions for Amax and IImax can be readily discerned.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Refer to comment #111.

Cl **69B** *SC* **69B.4.4** *P* **191** *L* **30** # 69

HEALEY, ADAM B Individual

Comment Type **E** *Comment Status* **A** *x*

Instead of "least mean square fit", it is probably better to refer to "fitted attenuation".

SuggestedRemedy

Per comment.

Response *Response Status* **C**

ACCEPT.

Cl **69B** *SC* **69B.4.6** *P* **192** *L* **26** # 26
MELLITZ, RICHARD I Individual

Comment Type **TR** *Comment Status* **A** *x;Pild_equation*

sub-clause 69b.4.6: Return loss does not descrimate between simple traget impedance mismatch and residual ISI.

SuggestedRemedy

Remove channel return loss and replace with a residual ISI parameter. See presenation.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Refer to mellitz_01_0906. Reduce channel return loss.

Change 15 to 12 and 9.64 to 6.75 in equations 69B-12 and 69B-13

Cl **69B** *SC* **69B.4.6** *P* **193** *L* **30** # 70
HEALEY, ADAM B Individual

Comment Type **E** *Comment Status* **A** *x*

No apparent value to the sentence, "In order to limit the crosstalk at TP4, the differential crosstalk is specified to meet the BER objective defined in 69.1.2." Presumably, all requirements are defined with this in mind.

SuggestedRemedy

Delete sentence.

Response *Response Status* **C**

ACCEPT.

Cl **69B** *SC* **69B.4.6** *P* **193** *L* **31** # 220
BAUMER, HOWARD A Individual

Comment Type **TR** *Comment Status* **A** *x*

This is a comment against Annex 69B.
The recommended crostalk limitation is assuming the crosstalk is coming from like transmitter but in actuallity it is not, it can come from any of the transmitter PMD types

SuggestedRemedy

Change " assume that aggressors and victim are driven by PHYs of the same type and transmit characteristics." to " assumes that the crosstalk aggressors can be driven by any compliant PMD type."

Response *Response Status* **C**

ACCEPT.

Cl **69B** *SC* **69B.4.6** *P* **194** *L* **47** # 101
VALLIAPPAN, MAGESH Individual

Comment Type **GR** *Comment Status* **A** *x;budget_closure*

System budget with penalties for transmitter/aggressor configuration is not compatible with an expectation of PHY interoperability and seriously affects the value of the standard.

SuggestedRemedy

We need to either tighten channel limits or transmitter requirements.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Refer to comment #15

ICRmin modified to close budget

Cl **69B** *SC* **69B.4.6.4** *P* **194** *L* # 20
MCCLELLAN, MR BRETT A Individual

Comment Type **T** *Comment Status* **A** *x;Pild_equation*

Submitted on behalf of Chris DiMinico.
1. In equation (69B-24) the PILD calculation results in a -0.8 penalty when ILD=0 and A(fb) = Amax(fb)?
2. The IL deviations in 802.3ap is defined as the difference between the IL(f) and the least mean squares fit A(f). ILD(f) exhibits an oscillatory behavior over frequency. The PILD results in a level offset penalty and may not appropriately account for the oscillatory ILD channel self-interference.
3. The source of the channel self-interference impairments generally associated with the oscillatory behavior is the re-reflected propagating waves (forward echo) often considered directly as a noise penalty.

SuggestedRemedy

Consider ILD as defined in 802.3ap directly as a noise penalty and include explicitly as a requirement for the test channel specified in 69A.2.2 test channel.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

refer to comment 15

PILD equation removed

Cl **69B** *SC* **69B.4.6.4** *P* **194** *L* **36** # 15

MOORE, CHARLES E Individual

Comment Type **T** *Comment Status* **A** *x;Pild_equation*

I do not feel comfortable with our ICR specification. While it is could work as stated i do not like the fact that the basic equation assumes the thru channel, victim and aggressor transmitters are better than minimum spec, and only applies in general if corrections are added.

SuggestedRemedy

Possible modifications could be:
1. Remove equations 69B-24 and 69B-25, the paragraphs explaining them, beginning at page 194, line 36 and ending page 195 line 18, and table 69B-2. Replace equation 69B-26 with:
ICRfit = 23.3 - 18.7log(f/5 GHz)
(Assuming a maximum value of 3dB for PILD. The 23.3 value may change if this assumption is wrong.)
2. Remove equations 69B-24 and 69B-25, the paragraphs explaining them, beginning at page 194, line 36 and ending page 195 line 18, and table 69B-2. Replace equation 69B-26 with:
ICRfit = 23.3 - 18.7log(f/5 GHz) + Bsys
add:
"If the system designer has no assurance that transmitter variability any better than specified under the appropriate port type transmitter specification and no assurance that the receiver interference tolerance will be any better than specified for the appropriate port receiver specification, he should a system bonus (Bsys) of 0. If better than specified parts will always be used compute Bsys as:
Bsys = 20*log10 ((minimum transmitter amplitude to beused/
maximum transmitter amplitude to be used)/(
minimum transmitter amplitude allowed by spec/
maximum transmitter amplitude allowed by spec)) +
20*log10 (minimum expected interference tolerance/
specified interference tolerance)
3*log10((minimum transmitter rise time to be used/
maximum transmitter rise time to be used)/
(minimum transmitter rise time allowed by spec/
maximum transmitter rise time allowed by spec))"
3. Rename 60B4.6 "Interfernece"
Change the first paragraph to:
"In order to limit interference at TP4, the differential crosstalk due to near-end and far-end aggressors and self interference are specified to meet the BER objective defined in 69.1.2."
add a new paragraph "Self interfernece"
"The self interference due to through channel irregularities at TP4 is calculated with the equation:
SI(f) = 14.3-10*log10 (1.6* ILD(f) ^2)
Change Equation 69B-17 to
PSXT = -10log(10 ^(-PSNEXT/10) + 10 ^(-PSFEXT/10) + 10 ^(-SI/10))
Remove equations 69B-24 and 69B-25, the paragraphs explaining them, beginning at page 194, line 36 and ending page 195 line 18, and table 69B-2. Replace equation 69B-26 with:
ICRfit = 20.3 - 18.7log(f/5 GHz) + Bsys
add:
"If the system designer has no assurance that transmitter variability is any better than specified for the appropriate port type transmitter and no assurance that the receiver interference tolerance will be any better than specified for the appropriate port receiver, he should a system bonus (Bsys) of 0. If better than specified parts will always be used compute Bsys as:
Bsys = 20*log10 ((minimum trnasmitter amplitude to be used/
maximum trnasmitter amplitude to be used)/(
minimum transmitter amplitude allowed by spec/
maximum transmitter amplitude allowed by spec)) +
20*log10 (minimum expected interference tolerance/
specified interference tolerance)
3*log10((minimum transmitter rise time to be used/
maximum transmitter rise time to be used)/
(minimum transmitter rise time allowed by spec/
maximum transmitter rise time allowed by spec))"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accept option 1.

Supporting text will be added to state the assumptions used in the derivation of ICRmin

Chicago rules straw poll: How to handle insertion loss deviation penalty?
a) fixed 3db 8
b) current pild equation 5
c) baumer_02_0906 4

Cl **69B** *SC* **69B.4.6.4** *P* **194** *L* **44** # 134
FRAZIER, JR., HOWARD M Individual

Comment Type **TR** *Comment Status* **A** *x;Pild_equation*

The term ILD(squared) or ILD^2 is problematic. What are units of dB squared? If SCC14 reviews this carefully, they will comment against the use of these units. This could (and probably will) result in the draft being rejected by RevCom.

SuggestedRemedy

Find another way to express this penalty that does not create new units.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

refer to comment 15

PILD equation removed

Cl **69B** *SC* **69B.4.6.4** *P* **194** *L* **44** # 221
BAUMER, HOWARD A Individual

Comment Type **TR** *Comment Status* **A** *x;Pild_equation*

This is a comment against Annex 69B.
What physical significance is the ILD^2 term? Units of dB^2 do not make any sense. Using an arbitrary parameter, that happens to fit a finite set of data points, to adjust limits for an unlimited unknown data set is not a justifiable scientific or engineering process.
If the intent is to make trade offs between residual ISI due to signal distortions cause by internal interactions within the channel itsself (non-smooth insertion loss transfer function) then a more physically relating parameter of that distortion should be used.

SuggestedRemedy

The task force should try correlating parameters along the lines of the risidual power of the insertion loss with respect to the average power or the power of the return loss, etc.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

refer to comment 15

PILD equation removed

Cl **69B** *SC* **69B.4.6.4** *P* **195** *L* **28** # 114
FRAZIER, JR., HOWARD M Individual

Comment Type **TR** *Comment Status* **A** *x*

In Figure 69B-7, the legend pointing to the upper curve is incorrect

SuggestedRemedy

Change legend to read ICRmin + PILD +PSYS

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

refer to comment 15

the only line in the figure will be ICRmin

Cl **69B** *SC* **69B.4.6.4** *P* **195** *L* **28** # 115
FRAZIER, JR., HOWARD M Individual

Comment Type **TR** *Comment Status* **A** *x;overlap_region*

The "High Confidence Region" in Figure 69B-7 is unclear

SuggestedRemedy

Using shading or cross-hatch so that the High Confidence Region can be readily discerned

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

refer to comment 15

the only line in the figure will be ICRmin which is expected to clarify where the high confidence region is.

Cl **70** *SC* **70** *P* **68** *L* **17** # 41
SPAGNA, FULVIO Individual

Comment Type **T** *Comment Status* **A**

The text refers to "output" impedance and "output" levels which is inappropriate this being an Input Return Loss specification.

SuggestedRemedy

Change text to read "input" impedance and "input" levels.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Refer response to comment #119.

Cl **70** *SC* **70** *P* **68** *L* **17** # 42

SPAGNA, FULVIO Individual

Comment Type **T** *Comment Status* **R**

The text for the differential input return loss refers to equations (70-1) and (70-2). I would reccomend inserting separate equations and graph for the receiver differential input return loss.

SuggestedRemedy

Label Figure 70-5 "Differential output return loss"
Add following text to 70.7.2.5
ReturnLoss(f) >= 10 (70-3)
for 50 MHz<= f <= 625 Mhz and
ReturnLoss(f) >= 10 - 10 x log(f/625) (70-4)
and a new figure, Figure 70-6, identical to Figure 70-5, but labelled Differential input return loss.

Response *Response Status* **C**

REJECT.

The consensus of the Task Force is that it is not necessary to duplicate the information.

Also refer to comments #43,#44

Cl **70** *SC* **70.1** *P* **58** *L* **8** # 167

BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A**

PHY is already defined.

SuggestedRemedy

Remove "(physical layer device)". Applies to 71.1 and 72.1.

Response *Response Status* **C**

ACCEPT.

Delete "(physical layer device)" in subclauses 70.1, 71.1 and 72.1.

Cl **70** *SC* **70.2** *P* **58** *L* **27** # 169

BOOTH, MR BRAD J Individual

Comment Type **ER** *Comment Status* **A**

Wording is awkward.

SuggestedRemedy

Change to read: "The 1000BASE-KX PMD performs the following three functions in support of the matching service interface primitives of 38.1.1: Transmit, Receive, and Signal Detect.
Also applies to 70.6.

Response *Response Status* **W**

ACCEPT.

Change 70.2 and 70.6 as suggested.

Cl **70** *SC* **70.3** *P* **58** *L* **33** # 80
LAW, DAVID J Individual

Comment Type **TR** *Comment Status* **A**

Subclause 70.3 'PMA requirements for Auto-Negotiation (AN) service interface'and 71.3 'PMA requirements for Auto-Negotiation (AN) service interface' both state that 'The PMA associated with this PMD shall support the AN service interface primitives defined in 73.9. The PMA shall generate the AN_LINK.indication to indicate a change in link status. The PMA shall use AN_Link.request to enable and disable operation.'.
Subclause 73.9.1.1 specifies that AN_LINK.indication has 'one of three values: READY, OK, or FAIL, indicating whether the underlying receive channel is intact and ready to be enabled (READY), intact and enabled (OK), or not intact (FAIL).
Subclause 73.9.2.1 specifies that AN_LINK.request has 'one of three values: SCAN_FOR_CARRIER, DISABLE, or ENABLE. The link_control=SCAN_FOR_CARRIER mode is used by the Auto-Negotiation function prior to receiving any DME pages or link_status=READY indications. During this mode, the PMA shall search for carrier and report link_status=READY when carrier is received, but no other actions shall be enabled.'.
There is however no mention of these primitives in the respective PMA, Clause 36 for the 1000BASE-X PMA, Clause 51 for the 10GBASE-R PMA and Clause 48 for the 10GBASE-X PMA. It is therefore difficult to know exactly what, for example, 'the PMA shall search for carrier and report link_status=READY when carrier is received' means when applied to the Clause 51 PMA used in the 10GBASE-KR PHY.
There is no signal called carrier (see Figure 51-3) and no mention of 'carrier' in that clause. In fact there seems to be only three mentions of in the entire set of 10Gb/s Ethernet clauses. The reason for that is that the only place that 'carrier' exists in 10Gb/s is as a signal generated by the RS.
Another example is that AN_LINK.indication should be set to FAIL when the receive channel is not intact. When a Remote Fault status is being received should that cause FAIL to be indicated, looking a 100BASE-X it would seem it should be optionally allowed to do so (see 24.3.1.5.1) but isn't this information only available in the PCS, not the PMA.

SuggestedRemedy

For each PHY type clearly define what the following:
When the underlying receive channel is intact and ready to be enabled.
When the underlying receive channel is intact and enabled.
When the underlying receive channel is not intact.
When carrier is being received.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the text as referred in ganga_02_0906. Provide editorial license to rephrase sentences appropriately.

Provide editorial license to craft language to allow Clause 37 with operation consistent with existing text in 73.

Cl **70** *SC* **70.3** *P* **58** *L* **35** # 78
LAW, DAVID J Individual

Comment Type **E** *Comment Status* **A**

Typo.

SuggestedRemedy

AN_Link.request' should read 'AN_LINK.request'. Please also correct:
Subclause 70.10.4.1, Page 71, Line 14 (twice)
Subclause 71.3, Page 74, Line 40
Subclause 71.10.4.1, Page 87, Line 30 (twice)
Subclause 72.3, Page 92, Line 44

Response *Response Status* **C**

ACCEPT.

Cl **70** *SC* **70.4** *P* **58** *L* **46** # 107
ABLER, JOSEPH M Individual

Comment Type **T** *Comment Status* **A** *kx_delay*

the spec of 24 bit PMD delay is inconsistent with the value of 32 listed in table 69-2. Either of these values are readily achieved for a PMD designed solely for 1.25Gbps operation, but it is not a reasonable value for a combo KR/KX4/KX design which may have a 32 or 64 bit data path.

SuggestedRemedy

specify the KX PMD delay to be the same as KX4 & KR (512 bit times)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Refer response to comment #166

The PMD delay is no longer independently bounded. The total delay for the PCS, PMA and PMD is constrained to 328 bit times.

Cl **70** *SC* **70.4** *P* **58** *L* **46** # 168
BOOTH, MR BRAD J Individual

Comment Type **TR** *Comment Status* **A**

The numbers don't work with what's in 36.5.1, as that number includes the PMD.

SuggestedRemedy

Change the numbers so the KX PMD is not called out separately.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Refer response to comment #166.

Cl **70** *SC* **70.6.7** *P* **61** *L* **14** # 170

BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A**

Run-on sentence.

SuggestedRemedy

Change comma after "ONE" to be a semi-colon and insert a comma after "otherwise". Also applies to 70.6.8, 70.6.9, 71.6.8, 71.6.9, 71.6.10.

Response *Response Status* **C**

ACCEPT.

Cl **70** *SC* **70.7.1** *P* **62** *L* **14** # 171

BOOTH, MR BRAD J Individual

Comment Type **ER** *Comment Status* **A**

Table could use some clean-up.

SuggestedRemedy

Reference to differential peak-to-peak output voltage should be 70.7.1.5. Delete footnote a as Figure 70-4 is in 70.7.1.5. Missing periods at the end of the other footnotes. Put DC common mode voltage limits in mV (also applies to 70.7.1.5).

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Change reference to differential peak-to-peak output voltage to 70.7.1.5.

Add missing periods at the end of all footnotes in Table 70-4. Similarly add periods at the end of footnotes for Table 71-4 and 72-6

Remove footnote 'a' from all the tables 70-4, 71-4 and 72-6.

The unit for common mode voltage is specified in V which is consistent with tables 54-3 (Cl.54.6.3) and in tables 71-4 and 72-6.

Cl **70** *SC* **70.7.1.1** *P* **63** *L* **8** # 106

ABLER, JOSEPH M Individual

Comment Type **T** *Comment Status* **R**

diagram shows a connection for CM RL measurement, but no CM spec is provided

SuggestedRemedy

add a CM RL spec of 6dB using same freq points & slope of diff RL (also make PICs update)

Response *Response Status* **C**

REJECT.

It is the consensus of the group that this is redundant with the EMC requirements of 70.9.4 and the receiver sensitivity requirements are not as demanding as 10GBASE-KR (which did choose to include transmitter common mode return loss as a measure to control common mode noise).

Cl **70** *SC* **70.7.1.4** *P* **63** *L* **40** # 172

BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A**

Missing period.

SuggestedRemedy

Insert period after 59.7.1.

Response *Response Status* **C**

ACCEPT.

Cl **70** *SC* **70.7.1.6** *P* **64** *L* **51** # 185

BAUMER, HOWARD A Individual

Comment Type **TR** *Comment Status* **R**

The return loss for 1000BASE-KX is relatively much tighter than 10GBASE-KX4. To accomedate existing 1000BASE-X type PMA/PMDs that previously did not have a return loss specification this return loss specification should be relaxed to be relatively the same as the 10GBASE-KX4 return loss. There is more than enough margin in the 1000BASE-KX link budget to acomidate this relaxation.

SuggestedRemedy

In line 51 change the frequency frange to 50MHz to 800MHz.
On page 65, line3 change 635MHz to 250MHz.
Line 6 f/625 to f/250.
Line 9 625MHz <= f <= 1250MHz to 250MHz <= f <= 800MHz.
page 68, line 17 1250MHz to 800MHz

Response *Response Status* **C**

REJECT.

Also refer to comment #74

Strawpoll:

Who in the room wants to keep the spec as is: 10
Who would like to change the spec: 5

There is no consensus to make a change.

The extendend frequence range is to account for faster transition times allowed for the 1000BASE-KX relative to signaling speed. Which is allowed to accommodate multirate designs.

Cl **70** *SC* **70.7.1.6** *P* **64** *L* **51** # 173

BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **R**

Parantheses not required around equations numbers.

SuggestedRemedy

Remove. Search draft for other instances and correct.

Response *Response Status* **C**

REJECT.

This is consistent with recommendations in 2005 IEEE standards style manual (section 17) and conventions followed in 802.3-2005.

Cl **70** *SC* **70.7.1.6** *P* **65** *L* **9** # 74

THALER, PATRICIA A Individual

Comment Type **TR** *Comment Status* **R**

It is not clear why the return loss specification is set this tightly nor why it is specified to such a high frequency (twice Nyquist) when the 8B/10B coding in Clause 71 doesn't bring it up so high.

SuggestedRemedy

Reduce the upper limit to something like 800 MHz and move the knee where the slope begins to 250 MHz.

Response *Response Status* **C**

REJECT.

Refer response to comment #185

Cl **70** *SC* **70.7.1.6** *P* **65** *L* **13** # 122

FRAZIER, JR., HOWARD M Individual

Comment Type **TR** *Comment Status* **R**

Figure 70-5 should look more like Figure 71-4 on page 80. The curves have the same slope, with differing upper frequency limits. The different shapes and scales are needlessly confusing to the reader.

SuggestedRemedy

Plot Figure 70-5 using the same scale as Figure 71-4.

Response *Response Status* **W**

REJECT.

If the reader refers to the equations there should be no ambiguity. The requirements not only have different upper frequency limits, but different lower frequency limits and therefore cannot use the same scale as Fig 71-4.

Cl **70** *SC* **70.7.1.7** *P* **65** *L* **43** # 174

BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A**

Missing period at end of paragraph.

SuggestedRemedy

Insert period.

Response *Response Status* **C**

ACCEPT.

Cl **70** *SC* **70.7.2** *P* **66** *L* **29** # 27

MELLITZ, RICHARD I Individual

Comment Type **TR** *Comment Status* **A**

sub-clause 70.7.2: Test fixture section need for return loss

SuggestedRemedy

Add test fixture (w/TP4) for return loss or the editorial equivalent.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

In 70.7.1 change sentence as follows:

"Transmitter characteristics at TP1 are summarized in Table 70-4 and detailed in the following subclauses."

In 70.7.2 change sentence as follows:
"Receiver characteristics at TP4 are summarized in Table 70-6 and detailed in the following subclauses."

In 70.7.1.1 change sentence as follows:

"The test fixture of Figure 70-2, or its functional equivalent, is required for measuring the transmitter specifications described in 70.7.1, with the exception of return loss."

Apply the above changes for Clauses 71 and 72 as well.

Also refer to comments #28, 29

Cl **70** *SC* **70.7.2.1** *P* **67** *L* **1** # 186

BAUMER, HOWARD A Individual

Comment Type **TR** *Comment Status* **R** *normative_channel*

This comment is dependent upon changing Annex 69B from informative to normative for 1000BASE-KX phy.
There should be a more direct tie between the transmitter specifications, channel specifications and the receiver requirements. Without the receiver's performance being directly tied to a compliant transmitter and a compliant normative channel there is no way to honestly label a system as being a compliant 1000BASE-KX system.

SuggestedRemedy

Replace the whole of 70.7.2.1 with:
70.7.2.1 bit error ratio
The reciever shall operate with a BER of better than 10^-12 when receiving a compliant transmit signal, as defined in 70.7.1, though a comliant backplane channel as defined in Annex 69B.

Response *Response Status* **U**

REJECT.

Per the response to comment 16 the consensus of the task force is that the channel remain informative and hence the requirements based on the test procedure in Annex 69A must remain.

Cl **70** *SC* **70.7.2.1** *P* **67** *L* **20** # 175

BOOTH, MR BRAD J Individual

Comment Type **ER** *Comment Status* **A**

Test pattern information should not be in the table.

SuggestedRemedy

Put the information in the paragraph preceding the table.
Also applies to Table 71-7.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Move the test pattern information from Tables 70-7, 71-7 and to 72-10 to the paragraph preceding the tables.

Delete the test pattern row from tables, Table 70-7, Table 71-7 and Table 72-10.

Insert the following test pattern line to the first paragraph in 70.7.2.1:

The receiver interference tolerance shall be measured as described in Annex 69A with the parameters specified in Table 70-7. The data pattern for the interference tolerence test shall be the jitter pattern test frame as defined in 59.7.1. The receiver shall satisfy the requirments for interference tolerance specified in Annex 69A.

Insert the following test pattern line to the first paragraph in 71.7.2.1:

The receiver interference tolerance shall be measured as described in Annex 69A with the parameters specified in Table 71-7. The data pattern for the interference tolerence test shall be the continuous jitter test pattern as defined in Annex 48A.5. The receiver shall satisfy the requirments for interference tolerance specified in Annex 69A.

Insert the following test pattern line to the first paragraph in 72.7.2.1:

The receiver interference tolerance shall be measured as described in Annex 69A with the parameters specified in Table 72-10. The data pattern for the interference tolerence test shall be the test patterns 2 and 3 as defined in 52.9.1.1. The receiver shall satisfy the requirements for interference tolerance specified in Annex 69A.

Cl **70** *SC* **70.7.2.1** *P* **67** *L* **23** # 176

BOOTH, MR BRAD J Individual

Comment Type **ER** *Comment Status* **A**

Poor wording. Don't list the reference equation number if it is the equation following the sentence.

SuggestedRemedy

Change to say "using the following equation:"
Also applies to other equations in the draft (like 70-4).

Response *Response Status* **C**

ACCEPT.

note to editor - look for other occurences in the document.

Cl **70** *SC* **70.7.2.1** *P* **67** *L* **23** # 116

FRAZIER, JR., HOWARD M Individual

Comment Type **TR** *Comment Status* **A**

The note and equation 70-3 seem like tutorial material. It does not seem necessary to state the derivation of the applied jitter.

SuggestedRemedy

Remove

Response *Response Status* **W**

ACCEPT.

see comment 49

Cl **70** *SC* **70.7.2.2** *P* **67** *L* **42** # 177

BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A**

Use a cross-reference to Table 70-7.

SuggestedRemedy

As per comment.

Response *Response Status* **C**

ACCEPT.

Cl **70** *SC* **70.7.2.5** *P* **68** *L* **17** # 119

FRAZIER, JR., HOWARD M Individual

Comment Type **TR** *Comment Status* **A**

The second sentence of the paragraph refers to output impedance rather than input return loss. This looks like a copy/paste problem from 70.7.1.6

SuggestedRemedy

Change second sentence to read: "This return loss requirement applies at all valid input levels."

Response *Response Status* **W**

ACCEPT.

Also refer to comment #41
and comment #120 regarding similar text in 71.7.2.5

Cl **70** *SC* **70.8** *P* **68** *L* **21** # 187

BAUMER, HOWARD A Individual

Comment Type **TR** *Comment Status* **R** *normative_channel*

There is no normative backplane channel interconnect specification for a 1000BASE-KX PMD type. To insure a fully interoperable compliant system all three sections, transmitter, channel and reciever are fully specified. This subclause points to an informative interconnect characteristics annex that is labeled as "a reference model". By not making the interconnect characteristics normative this implicitly makes any interconnect useable with the 1000BASE-KX transmitter / reciever pair.

SuggestedRemedy

On line 23 change "Informative" to "Normative" and adjust the pics accordingly.
Also either change the whole of Annex 69B to be normative or appropirately add in to all of the "it is recommended that" phases "for 1000BASE-KX xxx shall meet".

Response *Response Status* **C**

REJECT.

Refer response to comment #16.

Cl **70** *SC* **70.8** *P* **68** *L* **23** # 178

BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A**

Missing period at end of paragraph.

SuggestedRemedy

Insert period.

Response *Response Status* **C**

ACCEPT.

Cl **71** *SC* **71** *P* **84** *L* **41** # 43

SPAGNA, FULVIO Individual

Comment Type **T** *Comment Status* **R**

The text for the differential input return loss refers to equations (71-1) and (71-2). I would reccomend to decouple the two Return Loss specs and insert separate equations and graph for the receiver differential input return loss.

SuggestedRemedy

Label Figure 71-4 "Differential output return loss"
Add following text to 71.7.2.5:
"
ReturnLoss(f) >= 10 (71-5)
for 100 MHz<= f <= 625 Mhz and
ReturnLoss(f) >= 10 - 10 x log(f/625) (71-6)
for 625 Mhz <= f <= 2000 MHz.
"
Add a new figure, Figure 71-6, identical to Figure 70-4, but labelled Differential input return loss.
In 71.7.2.5 change references to 71-1 and 71-2 to (71-5) and (71-6) respectively

Response *Response Status* **C**

REJECT.

The consensus of the Task Force is that it is not necessary to duplicate the information.

Also refer to comments #42, #44

Cl **71** *SC* **71.1** *P* **74** *L* **10** # 179

BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A**

Extra period.

SuggestedRemedy

Remove period after "Clause 45".

Response *Response Status* **C**

ACCEPT.

Cl **71** *SC* **71.4** *P* **74** *L* **50** # 180
BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A**
Missing period at end of paragraph.

SuggestedRemedy
Insert period.

Response *Response Status* **C**
ACCEPT.

Cl **71** *SC* **71.5** *P* **75** *L* **11** # 55
HEALEY, ADAM B Individual

Comment Type **E** *Comment Status* **A**
PMD_signal_detect_n missing from Table 71-3. PMD_transmit_disable_n missing from Table 71-2.

SuggestedRemedy
Add these variables to the appropriate tables.

Response *Response Status* **C**
ACCEPT IN PRINCIPLE.

Refer response to comments #94 and #92.

Cl **71** *SC* **71.5** *P* **75** *L* **18** # 54
HEALEY, ADAM B Individual

Comment Type **E** *Comment Status* **A**
Inconsistent variable names: Global_PMD_transmit_disable/signal_detect.

SuggestedRemedy
In Table 71-2, change MDIO control variable to "Global PMD transmit disable" and PMD control variable to "Global_PMD_transmit_disable". In Table 71-3, change PMD status variable to "Global_PMD_signal_detect".

Response *Response Status* **C**
ACCEPT IN PRINCIPLE.

Refer response to comments #89 and #93.

Cl **71** *SC* **71.5** *P* **75** *L* **19** # 89
GANGA, ILANGO S Individual

Comment Type **T** *Comment Status* **A**
In Table 71-2 rename variable PMD_global_transmit_disable to Global_PMD_transmit_disable

SuggestedRemedy
In Table 71-2 rename variable PMD_global_transmit_disable to Global_PMD_transmit_disable

Response *Response Status* **C**
ACCEPT.

Also refer to comment #54

Cl **71** *SC* **71.5** *P* **75** *L* **20** # 92
GANGA, ILANGO S Individual

Comment Type **T** *Comment Status* **A**
Variables corresponding to Lane by Lane Transmit disable is not specified in table 71-2.

SuggestedRemedy
Add Lane by Lane Transmit disable variable to Table 71-2. Refer to subclause 53.3, add the last 4 rows from Table 53-2. Make suitable text change if any to subclause 71.6.6

Response *Response Status* **C**
ACCEPT.

Also refer to comment #55

Cl **71** *SC* **71.5** *P* **75** *L* **33** # 93
GANGA, ILANGO S Individual

Comment Type **T** *Comment Status* **A**
In Table 71-3 rename variable PMD_global_signal_detect to Global_PMD_signal_detect

SuggestedRemedy
In Table 71-3 rename variable PMD_global_signal_detect to Global_PMD_signal_detect. Make the same change to text in subclause 71.6.4 to be consistent with table and with Clause 45.

Response *Response Status* **C**
ACCEPT.

Also refer to comment #54

Cl **71** *SC* **71.5** *P* **75** *L* **35** # 94
GANGA, ILANGO S Individual

Comment Type **T** *Comment Status* **A**

Variables corresponding to Lane by Lane Signal detect as specified in subclause 71.6.4 is not documented in table 71-2.

SuggestedRemedy

Add Lane by Lane PMD Signal detect variable to Table 71-3. Refer to subclause 53.3, add the last 4 rows from Table 53-3. Make suitable text change if any to subclause 71.6.4

Response *Response Status* **C**

ACCEPT.

Also refer to comment #55

Cl **71** *SC* **71.6.4** *P* **76** *L* **43** # 96
GANGA, ILANGO S Individual

Comment Type **E** *Comment Status* **A**

Fix typo "Globabl" to Global

SuggestedRemedy

As per comment

Response *Response Status* **C**

ACCEPT.

Cl **71** *SC* **71.6.4** *P* **76** *L* **47** # 95
GANGA, ILANGO S Individual

Comment Type **T** *Comment Status* **A**

The PMD lane by lane signal detect function is currently defined under subclause 71.6.4 Global Signal Detect function

SuggestedRemedy

Have a separate subclause (say 71.6.5) for Lane by Lane signal detect function and move the text over to there. (similar to Clause 53.4.5)

Response *Response Status* **C**

ACCEPT.

Cl **71** *SC* **71.7.1** *P* **78** *L* **34** # 108
ABLER, JOSEPH M Individual

Comment Type **T** *Comment Status* **R**

TJ spec is inconsistent with RJ & DJ specs

SuggestedRemedy

change RJ to 0.28UI, need to also make change in sect 71.7.1.8

Response *Response Status* **C**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **71** *SC* **71.7.1** *P* **78** *L* **35** # 181
BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **A**

Footnote a not required as figure is in 71.7.1.4.

SuggestedRemedy

Remove footnote.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Refer response to comment #171

Cl **71** *SC* **71.7.1.1** *P* **79** *L* **8** # 105
ABLER, JOSEPH M Individual

Comment Type **T** *Comment Status* **R**

diagram shows a connection for CM RL measurement, but no CM spec is provided

SuggestedRemedy

add a CM RL spec of 6dB using same freq points & slope of diff RL (also make PICs update)

Response *Response Status* **C**

REJECT.

It is the consensus of the group that this is redundant with the EMC requirements of 71.9.4 and the receiver sensitivity requirements are not as demanding as 10GBASE-KR (which did choose to include transmitter common mode return loss as a measure to control common mode noise).

Cl **71** *SC* **71.7.2** *P* **83** *L* **22** # 28

MELLITZ, RICHARD I Individual

Comment Type **TR** *Comment Status* **A**

sub-clause 71.7.2: Test fixture section need for return loss

SuggestedRemedy

Add test fixture (w/TP4) for return loss or the editorial equivalent.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Refer response to comment #27.

Cl **71** *SC* **71.7.2.1** *P* **83** *L* **24** # 188

BAUMER, HOWARD A Individual

Comment Type **TR** *Comment Status* **R** *normative_channel*

This comment is dependent upon changing Annex 69B from informative to normative for 10GBASE-KX4 phy.
There should be a more direct tie between the transmitter specifications, channel specifications and the receiver requirements. Without the receiver's performance being directly tied to a compliant transmitter and a compliant normative channel there is no way to honestly label a system as being a compliant 10GBASE-KX4 system.

SuggestedRemedy

Replace the whole of 71.7.2.1 with:
71.7.2.1 bit error ratio
The reciever shall operate with a BER of better than 10^-12 1hen receiving a compliant transmit signal, as defined in 71.7.1, though a comliant backplane channel as defined in Annex 69B.

Response *Response Status* **U**

REJECT.

Per the response to comment 16 the consensus of the task force is that the channel remain informative and hence the requirements based on the test procedure in Annex 69A must remain.

Cl **71** *SC* **71.7.2.1** *P* **83** *L* **46** # 117

FRAZIER, JR., HOWARD M Individual

Comment Type **TR** *Comment Status* **A**

The note and equation 71-3 seem like tutorial material. It does not seem necessary to state the derivation of the applied jitter.

SuggestedRemedy

Remove

Response *Response Status* **W**

ACCEPT.

see comment 49

Cl **71** *SC* **71.7.2.4** *P* **84** *L* **33** # 124

FRAZIER, JR., HOWARD M Individual

Comment Type **ER** *Comment Status* **A**

"Channel" should be "channel".

SuggestedRemedy

Fix capitalization

Response *Response Status* **W**

ACCEPT.

Cl **71** *SC* **71.7.2.5** *P* **84** *L* **39** # 120

FRAZIER, JR., HOWARD M Individual

Comment Type **TR** *Comment Status* **A**

Interesting. Similar paragraph to 70.7.2.5, but different text.

SuggestedRemedy

Change second sentence to read: "This return loss requirement applies at all valid input levels."

Response *Response Status* **W**

ACCEPT.

This text appears to be a carry over from 54.6.4.5

Also refer to comments #119, #41

Cl **71** *SC* **71.8** *P* **84** *L* **43** # 189

BAUMER, HOWARD A Individual

Comment Type **TR** *Comment Status* **R** *normative_channel*

There is no normative backplane channel interconnect specification for a 10GBASE-KX4 PMD type.
To insure a fully interoperable compliant system all three sections, transmitter, channel and reciever need to be fully specified. This subclause points to an informative interconnect characteristics annex that is labeled as "a reference model". By not making the interconnect characteristics normative this implicitly makes any interconnect useable with the 10GBASE-KX4 transmitter / reciever pair.

SuggestedRemedy

On line 46 change "Informative" to "Normative" and adjust the pics accordingly.
Also either change the whole of Annex 69B to be normative or appropirately add in to all of the "it is recommended that" phases "for 10GBASE-KX4 xxx shall meet".

Response *Response Status* **C**

REJECT.

Refer response to comment #16.

Cl **72** *SC* **72.1** *P* **92** *L* **21** # 73

THALER, PATRICIA A Individual

Comment Type **GR** *Comment Status* **A**

Shouldn't clause 74 be included as an optional PHY clause?

SuggestedRemedy

Add Clause 73 FEC to the table.

Response *Response Status* **W**

ACCEPT.

Add Clause 74 FEC to the table 72-1.

Cl **72** *SC* **72.10.4.5** *P* **125** *L* **22** # 103

ABLER, JOSEPH M Individual

Comment Type **E** *Comment Status* **A**

receiver CM RL is no longer specified

SuggestedRemedy

remove from PICs

Response *Response Status* **C**

ACCEPT.

Remove item RC8 from 72.10.4.5

Cl **72** *SC* **72.5** *P* **93** *L* **19** # 90

GANGA, ILANGO S Individual

Comment Type **T** *Comment Status* **A**

In Table 72-2 rename variable PMD_global_transmit_disable to Global_PMD_transmit_disable

SuggestedRemedy

In Table 72-2 rename variable PMD_global_transmit_disable to Global_PMD_transmit_disable. Make the same change to text in subclause 72.6.5 and 72.6.8 to be consistent with table and with Clause 45.

Response *Response Status* **C**

ACCEPT.

Also see comment #53

Cl **72** *SC* **72.5** *P* **93** *L* **19** # 53

HEALEY, ADAM B Individual

Comment Type **E** *Comment Status* **A**

Inconsistent variable names: Global_PMD_transmit_disable/signal_detect.

SuggestedRemedy

In Table 72-2, change MDIO control variable to "Global PMD transmit disable" and PMD control variable to "Global_PMD_transmit_disable". In Table 72-3, change PMD status variable to "Global_PMD_signal_detect". In addition, in 72.6.4 (p. 94, l. 39), change "PMD_global_signal_detect" to "Global_PMD_signal_detect". In 72.6.5 (p. 95, l. 7) change "PMD_global_transmit_disable" to "Global_PMD_transmit_disable".

Response *Response Status* **C**

ACCEPT.

See comment #90

Cl **72** *SC* **72.5** *P* **93** *L* **35** # 91

GANGA, ILANGO S Individual

Comment Type **T** *Comment Status* **A**

In Table 72-3 rename variable PMD_global_signal_detect to Global_PMD_signal_detect

SuggestedRemedy

In Table 72-3 rename variable PMD_global_signal_detect to Global_PMD_signal_detect. Make the same change to text in subclause 72.6.4 to be consistent with table and with Clause 45.

Response *Response Status* **C**

ACCEPT.

Also see comment #53.

Cl **72** *SC* **72.6.10.2** *P* **96** *L* **24** # 182
BOOTH, MR BRAD J Individual

Comment Type **ER** *Comment Status* **A**

The reference to DME in token ring is confusing and has no relevance if they are different.

SuggestedRemedy

Delete information.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Delete sentence 'The DME defined for backplane Ethernet is different from that defined in IEEE Std 802.5.'

Add footnote 'The differential Manchester encoding defined for backplane Ethernet is different from that defined in IEEE Std 802.5.'

Cl **72** *SC* **72.6.10.2.2** *P* **96** *L* **52** # 190
BAUMER, HOWARD A Individual

Comment Type **T** *Comment Status* **A**

Missng shall

SuggestedRemedy

change "The control channel is transmitted &" to "The control channel shall be transmitted &" and add appropriate pics entry

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **72.6.10.2.2** *P* **97** *L* **8** # 30
THALER, PATRICIA A Individual

Comment Type **E** *Comment Status* **A**

It might be more clear to use the same term here that is used in defining the Manchester code above. Also, the sentence structure: "Since each control channel bit . . ." makes it sound like that is defined elsewhere when this the only place I see it specified.

SuggestedRemedy

Replace paragraph with "The data cell length shall be 8 10GBASE-KR baud. Therefore, the total length of the control channel is 256 10GBASE-KR baud.

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **72.6.10.2.3** *P* **97** *L* **15** # 191
BAUMER, HOWARD A Individual

Comment Type **T** *Comment Status* **A**

Missng shall

SuggestedRemedy

change "& update field is shown &" to "& update field shall be as shown &" and add appropriate pics entry

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **72.6.10.2.3** *P* **97** *L* **16** # 192
BAUMER, HOWARD A Individual

Comment Type **T** *Comment Status* **A**

Missng shall

SuggestedRemedy

change "& update field is transmitted &" to "& update field shall be transmitted &" and add appropriate pics entry

Response *Response Status* **C**

ACCEPT.

Change sentence as indicated and add 'Cell 15 of the coefficient update field sent first' to table 72.10.4.3 between CF7 and CF8 (Need to renumber the table entries)

Cl **72** *SC* **72.6.10.2.3.1** *P* **98** *L* **10** # 102
ABLER, JOSEPH M Individual

Comment Type **E** *Comment Status* **A**

reset is listed rather than "preset"

SuggestedRemedy

change to preset, lines 10, 23, & 38

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **72.6.10.2.3.1** *P* **98** *L* **10** # 194

BAUMER, HOWARD A Individual

Comment Type **T** *Comment Status* **A**

There is no "reset" command, this should probably be "preset"

SuggestedRemedy

Change "reset" to Preset"

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **72.6.10.2.3.1** *P* **98** *L* **10** # 58

HEALEY, ADAM B Individual

Comment Type **T** *Comment Status* **A**

Precedence of operators is clearly established in the coefficient update state machine via the definition of COEF_UPDATE (72.6.10.3.4) and does not need to be enforced elsewhere.

SuggestedRemedy

From 72.6.10.2.3.1 (p. 98, l. 10), 72.6.10.2.3.2 (p. 98, l. 23), and 72.6.10.2.3.3 (p. 98, l. 38), strike the text "If received, precedence is (1) reset, (2) initialize, and (3) increment/decrement."

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **72.6.10.2.3.1** *P* **98** *L* **10** # 22

THALER, PATRICIA A Individual

Comment Type **ER** *Comment Status* **A**

This comment also applies to lines 23 and 38. "reset" should be "preset"

SuggestedRemedy

replace "reset" with "preset"

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Note: this occurs twice in line 23 and 38.

Cl **72** *SC* **72.6.10.2.3.1** *P* **98** *L* **2** # 193

BAUMER, HOWARD A Individual

Comment Type **TR** *Comment Status* **A**

Unrelated text> The text beginning with the sentnce starting with "At" has nothing to do with sending or receiving the preset command. In fact this text effectively disallows the preset state from ever being achieved as it forces an initialize command to always follow a preset command.

SuggestedRemedy

Remove text starting with the sentnce beginging with "At" to the end of the paragraph.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Change the text starting at line 2, as follows:

"At that point the outgoing preset field shall be set to zero."

Cl **72** *SC* **72.6.10.2.3.2** *P* **98** *L* **17** # 195

BAUMER, HOWARD A Individual

Comment Type **TR** *Comment Status* **A**

Conflict in returned coefficient status for initialize state. 72.6.10.2.3.2 states that the initialize command is set until all coefficients indicate update, however, 72.6.10.4.2 states that the initialize state forces the value of c(0) to its maximum state therefor causing the returned coefficient status to be maximum.

SuggestedRemedy

Change "& status for all coefficients indicate updated." to "& status for coefficients c(-1) and c(1) indicate updated and status for coefficient c(0) indicatse maximum."

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Change 'The initialize control shall only be initially sent when all coefficient status fields indicate not_updated, and will then continue to be sent until update status for all coefficients indicate updated.'

'The initialize control shall only be initially sent when all coefficient status fields indicate not_updated, and will then continue to be sent until no coefficent status field indicates not_updated.'

See comment 229

Cl **72** *SC* **72.6.10.2.3.2** *P* **98** *L* **23** # 196
BAUMER, HOWARD A Individual

Comment Type **T** *Comment Status* **A**
There is no "reset" command, this should probably be "preset"

SuggestedRemedy
Change "reset" to Preset"

Response *Response Status* **C**
ACCEPT.

Cl **72** *SC* **72.6.10.2.3.3** *P* **98** *L* **38** # 197
BAUMER, HOWARD A Individual

Comment Type **T** *Comment Status* **A**
There is no "reset" command, this should probably be "preset"

SuggestedRemedy
Change "reset" to Preset", two instances

Response *Response Status* **C**
ACCEPT.

Cl **72** *SC* **72.6.10.2.4** *P* **99** *L* **3** # 198
BAUMER, HOWARD A Individual

Comment Type **T** *Comment Status* **R**
Missng shall

SuggestedRemedy
change "The status report field is used &" to "The status report field shall be used &" and add appropriate pics entry

Response *Response Status* **C**
REJECT.

The function of this field is implicit in this definition.

Cl **72** *SC* **72.6.10.2.4** *P* **99** *L* **4** # 199
BAUMER, HOWARD A Individual

Comment Type **T** *Comment Status* **A**
Missng shall

SuggestedRemedy
change "& status report field is shown &" to "& status report field shall be as shown &" and add appropriate pics entry

Response *Response Status* **C**
ACCEPT.

Cl **72** *SC* **72.6.10.2.4** *P* **99** *L* **4** # 200
BAUMER, HOWARD A Individual

Comment Type **T** *Comment Status* **A**
Missng shall

SuggestedRemedy
change "& status report field is transmitted &" to "& status report field shall be transmitted &" and add appropriate pics entry

Response *Response Status* **C**
ACCEPT.

Cl **72** *SC* **72.6.10.2.5** *P* **100** *L* **15** # 201
BAUMER, HOWARD A Individual

Comment Type **T** *Comment Status* **R**
Missng shall

SuggestedRemedy
change "& process responds &" to "& process shall respond &" and add appropriate pics entry

Response *Response Status* **C**
REJECT.

This requirement is covered by 72.6.10.4.3 and PICS CF37.

Cl **72** *SC* **72.6.10.2.6** *P* **100** *L* **21** # 202
BAUMER, HOWARD A Individual

Comment Type **E** *Comment Status* **R**
grammar / spelling

SuggestedRemedy
change "& Sequence of order &" to "& Sequence of an order &"

Response *Response Status* **C**
REJECT.

This is not grammatical error,

"a Pseudo-Random Bit Sequence of order 11 generator.." is the correct and intended phrase.

Cl **72** *SC* **72.6.10.3.1** *P* **101** *L* **15** # 32
THALER, PATRICIA A Individual

Comment Type **E** *Comment Status* **A**
Variable list should be in alphabetical order.

SuggestedRemedy
Correct ordering. "preset" and "local_rx_ready" are out of order. Also others:
frame_offset
new_coeff
new_marker

Response *Response Status* **C**
ACCEPT.

Cl **72** *SC* **72.6.10.3.1** *P* **101** *L* **3** # 57
HEALEY, ADAM B Individual

Comment Type **T** *Comment Status* **A**
Precedence of operators is clearly established in the coefficient update state machine via the definition of COEF_UPDATE (72.6.10.3.4) and does not need to be enforced elsewhere.

SuggestedRemedy
Strike &"and preset is not activated and initialize is not activated" for both "dec" and "inc" variable definition.

Response *Response Status* **C**
ACCEPT.

Cl **72** *SC* **72.6.10.3.1** *P* **102** *L* **10** # 56
HEALEY, ADAM B Individual

Comment Type **E** *Comment Status* **A**
Variable names should be sorted in ascending alphabetical order.

SuggestedRemedy
Relocate frame_offset definition to the correct location in the order.

Response *Response Status* **C**
ACCEPT.

Cl **72** *SC* **72.6.10.3.4** *P* **103** *L* **29** # 33
THALER, PATRICIA A Individual

Comment Type **E** *Comment Status* **A**
The statement of priority here is redundant. Priority is already established in the definition of preset, initialize, inc and dec variables. As defined only one can be true at a time. Priority is also covered in the text on training frame structure. A little redundancy is okay but excessive redundancy makes it more difficult to read the standard.

SuggestedRemedy
Delete the sentence beginning "if multiple actions are requested..." including the ordered list.

Response *Response Status* **C**
ACCEPT IN PRINCIPLE.

See comment #57.

Cl **72** *SC* **72.6.10.4.2** *P* **104** *L* **17** # 229

THALER, PATRICIA A Individual

Comment Type **TR** *Comment Status* **A**

RE: At the start of training the initial value of c(0) shall be set to the maximum value that satisfies the constraints of section 72.7.1.10.
This requirement is not feasible - it requires the signal to be set to exactly the maximum allowed signal level.
Rationale:
The only constraint that 72.7.1.10 places on the maximum value of c(0) is the requirement: "Any coefficient update equal to increment that would result in a violation of 72.7.1.4 shall return a coefficient status value maximum for that coefficient.." It also gives a value for maximum v2 when c(1) and c(-1) are disabled but that doesn't apply in this case - they aren't disabled. 72.7.1.4 requires the peak to peak voltage to be less than 1200mV. Therefore to satisfy 72.6.10.4.2 to the letter, the transmitter would have to set c(0) to a level such that the peak to peak voltage was exactly 1200 mV which isn't possible.

SuggestedRemedy

Add a better definition for the initialization condition. One way would be to specify a range for v2.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

The sentence needs better wording: Change from
'When the training state diagram enters the INITIALIZE state, the transmitter equalizer shall be configured such that Rpre and Rpst, as defined in 72.7.1.10, are 1.29 ± 10% and 2.57 ± 10% respectively. At the start of training the initial value of c(0) shall be set to the maximum value that satisfies the constraints of section 72.7.1.10.'

To:
'When the training state diagram enters the INITIALIZE state, the transmitter equalizer shall be configured such that Rpre and Rpst are 1.29 ± 10% and 2.57 ± 10% respectively. At the start of training the initial value of c(0) shall be set such that v2 is at least 140mV and satisfies the constraints of 72.7.1.10. Rpre, Rpst and v2 are defined in 72.7.1.11.'

See also comment 110 for possible subclause numbering changes.

Cl **72** *SC* **72.6.10.4.3** *P* **107** *L* **2** # 59

HEALEY, ADAM B Individual

Comment Type **T** *Comment Status* **A**

The exit conditions from the NOT_UPDATED state can be simplified to add clarity. The function COEF_UPDATE yields a new coefficient output that is either within the valid range of the coefficient or outside of it. Each of the branches updates the coefficient and set the status code based value returned by COEF_UPDATE relative to valid range of the coefficient. None of the branch conditions rely on command that yielded the new coefficient value.

SuggestedRemedy

Update the state transition test conditions as follows: NOT_UPDATED to MAXIMUM is new_coef >= MAX_LIMIT, NOT_UPDATED to UPDATED is (new_coef < MAX_LIMIT)*(new_coef > MIN_LIMIT), NOT_UPDATED to MINIMUM is new_coef <= MIN_LIMIT

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add state UPDATE_COEFF between NOT_UPDATED and the other states.

UPDATE_COEFF will only contain the call to the COEFF_UPDATE function.

NOT_UPDATED will only contain the assignment 'update_status <= not_updated' and 'reset+mr_restart_training' will remain an open transition into not_updated

The transition from NOT_UPDATED to UPDATE_COEFF will be (inc + dec + preset + initialize)

The transition from MAXIMUM, MINIMUM, and UPDATED to NOT_UPDATED will be hold

The definition of hold in 72.6.10.3.1 will be updated as follows:

'Boolean variable set to TRUE when a training frame has been completely received and the coefficient update field of that frame for this coefficient is hold, and neither preset or initialize are activated, and set to FALSE on reception of any other value.'

Cl **72** *SC* **72.6.6** *P* **95** *L* **10** # 231

GHIASI, ALI Individual

Comment Type **TR** *Comment Status* **R**

It is not speccifed what type of loopback the PHY should provide system or remote loopback

SuggestedRemedy

Please specify local loop back

Response *Response Status* **W**

REJECT.

The direction of loopback is clearly defined in 45.2.

Cl **72** *SC* **72.7.1.10** *P* **112** *L* **34** # 205

BAUMER, HOWARD A Individual

Comment Type **E** *Comment Status* **R**

There is a referance to management control of the transmit equalizer but no definition of this control can be found in this draft. How this management control is done needs to be described.

SuggestedRemedy

Add the following sentence after "& via management.":
The optional management control to configure the state of the transmitter equalizer is beyond the scope of this standard and is left up to the individual implementers.

Response *Response Status* **C**

REJECT.

Refer to the text that was previously added to clause 45.2.1.78 to define the method for controlling the transmit equalizer:

'The assignment of bits in the 10GBASE-KR LP coefficient update register is shown in Table 45-55. Normally the bits in this register are read only; however, when training is disabled, by setting low bit 1 in the 10GBASE-KR PMD control register, the 10GBASE-KR LP coefficient update register becomes writeable.'

Cl **72** *SC* **72.7.1.10** *P* **113** *L* **1** # 206

BAUMER, HOWARD A Individual

Comment Type **T** *Comment Status* **A**

Missing shall

SuggestedRemedy

Change "The results are to be &" to "The results shall be &" and add the appropriate pics.

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **72.7.1.10** *P* **113** *L* **12** # 228

THALER, PATRICIA A Individual

Comment Type **TR** *Comment Status* **A**

The range of behavior allowed by this table could produce very unexpected results. It doesn't constrain a tap change to be close to a change of that specific tap.
For example: for the an update that increments c(1), a compliant transmitter could decrease v1 by -5, increase v2 by 20 and increase v3 by 5 so that the relative amplitudes of v2 and v3 change by 15 mV - the same relative change that would be legitimate for an update that increments c(-1).
For another example, an update to increment c(0) could increase v1 or v3 by 5 mV while increasing v2 by 20 mV. Again a 15 mV relative change with a similar effect on wave form to if c(1) or c(2) were incremented

SuggestedRemedy

Require that the changes be the same for the two or three voltages that have the same direction of change in the table for a given update. I'm not sure how to word that clearly. For example for an increment to c(1), not only should v2 and v3 increase by 5 to 20 mV. It should also be required that the increases of the two voltages be the same to within 5 mV. Similarly when c(0) is incremented, the changes in all three voltages should be within 5 mV of each other.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Add a footnote to Table 72-7: 'For each row of Table 72-7 the magnitude of the values shall vary by no more than 5mV.'

Cl **72** *SC* **72.7.1.10** *P* **113** *L* **12** # 110

THALER, PATRICIA A Individual

Comment Type **E** *Comment Status* **A**

Notes a and b are applied to one table cell, but it appears that they are intended to apply to the whole left and right sides of the table. Move them to the captions: coefficient updatae and requirements.

SuggestedRemedy

Move the notes.
Also, it would be more readable if the material after page 112 line 33 to the end of this subclause came after 72.7.1.11. Consider moving it to a separate subclause.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Reverse the order of 72.7.1.11 and 72.7.1.10, so that the waveform measurement explanation comes before the transmitter output waveform requirement.

Cl **72** *SC* **72.7.1.10** *P* **113** *L* **48** # 207

BAUMER, HOWARD A Individual

Comment Type **TR** *Comment Status* **R**

There is no lower limit for Rpst or Rpre which contributes to link budget failure. Proposed change helps limit the amount of crosstalk that can be created.

SuggestedRemedy

Add list items:
g) Any coefficient update equal to increment that would cause Rpst or Rpre to be less than 1.33 shall return a coefficient status value maximum for that coefficient.
h) Any coefficient update equal to decrement that would cause Rpst or Rpre to be less than 1.33 shall return a coefficient status value minimum for that coefficient.
Change the preset state to be such that the transmitter state meets list item g & h above.

Response *Response Status* **W**

REJECT.

see comment 15

ICRmin now includes margin for differences in victim and aggressor equalization settings

---

Cl **72** *SC* **72.7.1.11** *P* **114** *L* **10** # 48

HEALEY, ADAM B Individual

Comment Type **TR** *Comment Status* **A**

Incorrect test pattern specified.

SuggestedRemedy

The test pattern for the transmitter output waveform is the square wave test pattern defined in 52.9.1.2, with a run of at least 8 consecutive ones.

Response *Response Status* **W**

ACCEPT.

Cl **72** *SC* **72.7.1.3** *P* **108** *L* **45** # 60

HEALEY, ADAM B Individual

Comment Type **T** *Comment Status* **A**

The statement that the corresponding unit interval is nominally 96.96 ps is not precise or necessary

SuggestedRemedy

Strike the statement.

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **72.7.1.4** *P* **108** *L* **51** # 203

BAUMER, HOWARD A Individual

Comment Type **TR** *Comment Status* **R**

This also applies to page 113 line 40 in table 72-8. Allowable maximum output amplitude variance is to high contributing to link budget failure. Proposed change helps limit the amount of crosstalk that can be created.

SuggestedRemedy

Change 1200mV to 900mV
in table 72-8 change 400-600 to 350-450

Response *Response Status* **W**

REJECT.

see comment 15

ICRmin now includes margin for the current transmitter voltage range.

Cl **72** *SC* **72.7.1.4** *P* **108** *L* **52** # 61

HEALEY, ADAM B Individual

Comment Type **T** *Comment Status* **A**

30 mVp-p does not use the preferred subscript for "peak-to-peak". In addition, this text does not appear in the corresponding subclauses for 1000BASE-KX and 10GBASE-KR and it is not clear that it needs to be here.

SuggestedRemedy

Suggest deleting sentence or at least changing the text to "30 mV peak-to-peak".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change text to: '30 mV peak-to-peak

Cl **72** *SC* **72.7.1.6** *P* **110** *L* **36** # 45

SPAGNA, FULVIO Individual

Comment Type **T** *Comment Status* **A**

Equation is inconsistent with frequency range.

SuggestedRemedy

In 72-7 replace "5156 MHz" with "2000 MHz"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Same as comment #104

Cl **72** *SC* **72.7.1.6** *P* **110** *L* **36** # 104

ABLER, JOSEPH M Individual

Comment Type **T** *Comment Status* **A**

equation is incorrect

SuggestedRemedy

Denominator should be 2000 for current definition. Is there a reason for different freq points & slope vs. diff RL?

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

ReturnLoss(f) >= 6 dB for 50 MHz <= f < 2500 MHz and

ReturnLoss(f) >= 6-12*log10(f/2500 MHz) for 2500 MHz <= f <= 7500 MHz

Check to ensure figures are consistent with differential and common-mode return loss equations.

Cl **72** *SC* **72.7.1.7** *P* **111** *L* **28** # 204

BAUMER, HOWARD A Individual

Comment Type **TR** *Comment Status* **A**

The rising edge transition time specification has not equalization setting requirement placed on it whereas the falling edge is specified in the no equalization (preset) state.

SuggestedRemedy

Specify the rising edge transition time only for the no equalized (preset) state by changing "& wave test pattern of 49.2.8." to "wave test pattern of 49.2.8 with no transmitter equalization."

Response *Response Status* **W**

ACCEPT.

Cl **72** *SC* **72.7.1.7** *P* **111** *L* **28** # 34

THALER, PATRICIA A Individual

Comment Type **TR** *Comment Status* **A**

As written, the text "with no transmitter equalization" applies to the falling edge test only. Presumably it should apply to the rising edge test too.

SuggestedRemedy

At the beginning of the paragraph insert
"Transition time is measured with no transmitter equalization."
Delete "with no transmitter equalization" in the falling edge sentence.
Alternatively, I would be satisfied if "with no transmitter equalization" is added to the rising edge sentence.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

See comment #204

Cl **72** *SC* **72.7.1.7** *P* **111** *L* **28** # 71

HEALEY, ADAM B Individual

Comment Type **T** *Comment Status* **R**

While I agree that it is prudent to limit the minimum transition time as a means of crosstalk control, there is a very detailed set of transmitter output waveform requirements defined in 72.7.1.10 and it is not clear that maximum limit to transition time restricts anything that isn't already restricted in a more meaningful way by 72.7.1.10. In other words, is it possible for a waveform with an excessively slow transition time to meet the requirements of Table 72-8, and if so, what is the real impact of such a waveform on system performance?

SuggestedRemedy

Investigate the need for an upper bound on transition time and eliminate the requirement if it is not necessary.

Response *Response Status* **C**

REJECT.

It is possible to meet the requirements of 72.7.1.10 with excessively slow transition times and hence an independent spec is warranted.

Cl **72** *SC* **72.7.1.7** *P* **111** *L* **31** # 72

HEALEY, ADAM B Individual

Comment Type **T** *Comment Status* **A**

It is more appropriate to specify the test pattern to be the "square wave test pattern defined in 52.9.1.2, with a run of at least 8 consecutive ones." In addition, rather than measuring rise time relative to the peak-to-peak voltage range, it is more appropriate to specify the levels relative to v2 and v5 as defined in 72.7.1.11 in order to achieve a more stable measurement (up to 5% overshoot is allowed by Table 72-8, which would impact the measurement).

SuggestedRemedy

Per comment.

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **72.7.1.8** *P* **111** *L* **41** # 46

HEALEY, ADAM B Individual

Comment Type **E** *Comment Status* **A**

Double quotes around the digits 1 and 0.

SuggestedRemedy

First, a consistent treatment for the designation of logical digits in-line with text should be established (review prior art). Then apply this practice consistently (note the "0, 1, 0, 1" text on the following line).

Response *Response Status* **C**

ACCEPT.

Remove double quotes in line 41
Remove commas inbetween bit sequence 0101

Cl **72** *SC* **72.7.1.8** *P* **111** *L* **42** # 47

HEALEY, ADAM B Individual

Comment Type **T** *Comment Status* **R**

A more clear definition of the nominal pulse width may be valuable in to facilitate of consistency in measurement.

SuggestedRemedy

Define the nominal pulse width to be the average width of one and zero pulses.

Response *Response Status* **C**

REJECT.

The error due to assuming the nominal pulse width is negligible and no change is required.

Cl **72** *SC* **72.7.1.9** *P* **111** *L* **49** # 261

GHIASI, ALI Individual

Comment Type **TR** *Comment Status* **R**

Transmitter jitter is tested with 4 MHz High pass filter and this must match the receiver jitter tolerance filter

SuggestedRemedy

Transmitter jitter must be tested with 400 KHz to match the receiver filter otherwise the transmitter and receiver canboth pass but the link will fail.

Response *Response Status* **W**

REJECT.

refer to comment 260

Cl **72** *SC* **72.7.2** *P* **115** *L* **29** # 29

MELLITZ, RICHARD I Individual

Comment Type **TR** *Comment Status* **R**

sub-clause 72.7.2: Test fixture section need for return loss

SuggestedRemedy

Add test fixture (w/TP4) for return loss or the editorial equivalent.

Response *Response Status* **W**

REJECT.

Refer response to comment #27

Cl **72** *SC* **72.7.2.1** *P* **116** *L* **1** # 208

BAUMER, HOWARD A Individual

Comment Type **TR** *Comment Status* **R** *normative_channel*

This comment is dependent upon changing Annex 69B from informative to normative for 10GBASE-KR phy.
There should be a more direct tie between the transmitter specifications, channel specifications and the receiver requirements. Without the receiver's performance being directly tied to a compliant transmitter and a compliant normative channel there is no way to honestly label a system as being a compliant 10GBASE-KR system.

SuggestedRemedy

Replace the whole of 72.7.2.1 with:
72.7.2.1 Bit error ratio
The reciever shall operate with a BER of better than 10^-12 1hen receiving a compliant transmit signal, as defined in 72.7.1, though a comliant backplane channel as defined in Annex 69B.

Response *Response Status* **W**

REJECT.

Per the response to comment 16 the consensus of the task force is that the channel remain informative and hence the requirements based on the test procedure in Annex 69A must remain.

Cl **72** *SC* **72.7.2.1** *P* **116** *L* **23** # 118

FRAZIER, JR., HOWARD M Individual

Comment Type **TR** *Comment Status* **A**

The note and equation 72-10 seem like tutorial material. It does not seem necessary to state the derivation of the applied jitter.

SuggestedRemedy

Remove

Response *Response Status* **W**

ACCEPT.

see comment 49

Cl **72** *SC* **72.7.2.1** *P* **116** *L* **36** # 52

HEALEY, ADAM B Individual

Comment Type **E** *Comment Status* **A**

The correction factor for transition time should be located in Annex 69A, just as the correction factor for amplitude is.

SuggestedRemedy

Relocate this text, and the related text in clauses 70 and 71, to Annex 69A.2.2.

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **72.7.2.1** *P* **116** *L* **4** # 262

GHIASI, ALI Individual

Comment Type **TR** *Comment Status* **R**

ap receivers have interference tolerance but not test has been provided to determine if the combination of a transmitter and backplane will pass with margin. Creating an standard where the user can't verify their link will work and with how much margin is against IEEE standard pracice.

SuggestedRemedy

There are 3 options to resolve this major weakness and interoperability of ap standard
I. Move all the electrical related to KR to the Annex and call it informative
II. Define a test similar to LRM/SFP+ dWDP test by using a reference receiver with 4T/2 FFE and 5 T spaced DFE. This code is available in 802.3aq.
III. Define a set of Normative channels

Response *Response Status* **W**

REJECT.

I. We need to define at least two of the link components normatively to completely define the link. We have chosen to specify the transmitter and the receiver.

II. It is the consensus of the task force that the channel is going to be informative, see comment 16. This another means of specifying a normative channel and does not include sufficient detailed information to judge its merits.

III. The channel will be informative, see comment 16.

Cl **72** *SC* **72.7.2.1** *P* **116** *L* **4** # 260

GHIASI, ALI Individual

Comment Type **TR** *Comment Status* **R**

ap receiver is specified to be tested without the credited SJ the transmitter was given by applying a 4 MHz High pass filter. Transmitter jitter in the range of 100'sKHz to 4 MHz which was filtered by the transmitter high pass filter may break the receiver.

SuggestedRemedy

Propose to add SJ to the receiver interference tolerance with following amplitude and frequncy
40 KHz - 5 UI
200 KHz - 1 UI
400 KHz - 0.5 UI
>400 KHz to 40 MHz - 0.1 UI

Response *Response Status* **W**

REJECT.

after significant discussion; straw poll:

1) add swept sinusoidal jitter to the interference tolerance test: yes 6, no 5

2) reduce CDR to 400 kHz: yes 6, no 5

There is not enough consensus to make a change.

The counterpoint view to the suggested remedy was that knowledge of the high pass corner frequency used to measure transmit jitter provides the designer sufficient to set the tracking bandwidth of the receiver CDR.

Cl **72** *SC* **72.7.2.1** *P* **116** *L* **5** # 233

THALER, PATRICIA A Individual

Comment Type **TR** *Comment Status* **A** *normative_channel*

The referenced test is not adequate to ensure that receivers that pass this test will work on all the channels within the informative channel model. It tests on a single channel when backplane channel characteristics vary significantly. It only tests the ability of the transmitter to adapt to one set of conditions and therefore it is likely to return false positives.

SuggestedRemedy

Change the test to ensure a receiver that meets the test will interoperate with the transmitters of this PHY over the channels in the channel model.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

straw poll:
add a second test case for 10GBASE-KR from moore_01_0906
yes 11
no 1

The pattern generator is specified to represent worst case transmitter characterisitics.

To improve coverage of channels, add a second test case for 10GBASE-KR with mTC of 0.5 and amplitude of broadband noise of 12mV RMS based on moore_01_0906.

Cl **72** *SC* **72.7.2.4** *P* **117** *L* **8** # 125

FRAZIER, JR., HOWARD M Individual

Comment Type **ER** *Comment Status* **A**

"Channel" should be "channel".

SuggestedRemedy

Fix capitalization

Response *Response Status* **W**

ACCEPT.

Cl **72** *SC* **72.7.2.5** *P* **117** *L* **14** # 109

ABLER, JOSEPH M Individual

Comment Type **E** *Comment Status* **A**

since the RL equations include an equation stating RL(f)>=, the wording "greater than or equal" in this section is redundant

SuggestedRemedy

state that the receiver shall meet the requirements of eq 72-4 & 72-5 (consistent with wording in sect 72.7.1.5)

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **72.7.2.5** *P* **117** *L* **14** # 121

FRAZIER, JR., HOWARD M Individual

Comment Type **TR** *Comment Status* **A**

Interesting. Similar paragraph to 70.7.2.5, but different text.

SuggestedRemedy

Change second sentence to read: "This return loss requirement applies at all valid input levels."

Response *Response Status* **W**

ACCEPT.

Also refer to comments #119, 120.

Cl **72** *SC* **72.7.2.5** *P* **117** *L* **16** # 44

SPAGNA, FULVIO Individual

Comment Type **T** *Comment Status* **R**

The text for the differential input return loss refers to equations (72-4) and (72-5). I would reccomend decouple the two specifications and insert separate equations and graph for the receiver differential input return loss.

SuggestedRemedy

Label Figure 72-9 "Differential output return loss"
Add following text to 72.7.2.5:
"
ReturnLoss(f) >= 9 (72-12)
for 50 MHz<= f <= 2500 MHz and
ReturnLoss(f) >= 9 - 12 x log(f/2500) (72-13)
for 2500 Mhz <= f <= 7500 MHz.
"
Add a new figure, Figure 72-13, identical to Figure 72-9, but labelled Differential input return loss.
In 72.7.2.5 change references to 72-4 and 72-5 to (72-12) and (72-13) respectively

Response *Response Status* **C**

REJECT.

The consensus of the Task Force is that it is not necessary to duplicate the information.

Also refer to comments #42,43

Cl **72** *SC* **72.8** *P* **117** *L* **21** # 209

BAUMER, HOWARD A Individual

Comment Type **TR** *Comment Status* **R** *normative_channel*

There is no normative backplane channel interconnect specification for a 10GBASE-KR PMD type.
To insure a fully interoperable compliant system all three sections, transmitter, channel and reciever need to be fully specified. This subclause points to an informative interconnect characteristics annex that is labeled as "a reference model". By not making the interconnect characteristics normative this implicitly makes any interconnect useable with the 10GBASE-KR transmitter / reciever pair.

SuggestedRemedy

On line 46 change "Informative" to "Normative" and adjust the pics accordingly.
Also either change the whole of Annex 69B to be normative or appropirately add in to all of the "it is recommended that" phases "for 10GBASE-KR xxx shall meet".

Response *Response Status* **W**

REJECT.

Please refer to comment 16

Cl **72** *SC* **72.8** *P* **117** *L* **21** # 99

PALM, STEPHEN R Individual

Comment Type **TR** *Comment Status* **R** *normative_channel*

There is no normative backplane channel interconnect specification for a 10GBASE-KR PMD type.

SuggestedRemedy

To insure a fully interoperable compliant system all three sections, transmitter, channel and reciever need to be fully specified.

Response *Response Status* **W**

REJECT.

See comment #16

Cl **73** *SC* **73.1** *P* **127** *L* **47** # 35

BARRASS, HUGH Individual

Comment Type **E** *Comment Status* **A**

"Highly recommended" is not a preferred phrase and adds no meaning in addition to "recommended."
If the committee wish to convey the idea that the behavior is "really, really, highly and strongly recommended with our biggest wishes and both fingers crossed" they should do so by writing "recommended."

SuggestedRemedy

Change "Highly recommended" to "recommended" - 2 instances.

Response *Response Status* **C**

ACCEPT.

Cl **73** *SC* **73.2** *P* **128** *L* **6** # 87

LAW, DAVID J Individual

Comment Type **T** *Comment Status* **A**

Wont it be rather unusual for the MAC Client to be LLC in the case of Backplane Ethernet.

SuggestedRemedy

Suggest that 'LLC--LOGICAL LINK CONTROL' be changed to read "LLC (LOGICAL LINK CONTROL) OR OTHER MAC CLIENT' as is the normal designation for this sublayer in IEEE Std 802.3.

Response *Response Status* **C**

ACCEPT. Note that page number should be 128.

Cl **73** *SC* **73.3** *P* **128** *L* **47** # 23

BARRASS, HUGH Individual

Comment Type **TR** *Comment Status* **A**

It is not clear how the multiple PHYs might share an MDI (or even what the definition of such a "shared MDI might be). It is made clear that a KX4 PHY must use lane 1 for autoneg (73.5.1.1) and also it implies (but doesn't state) that KR and KX should use lane 1 (73.7.6) - although lane 1 is not defined in Clauses 70 & 72.
My reading of the text suggests that an implementer may choose to send KX on lane 2 and KR on lane 3. In fact, the use of "at least one of" in the text for 73.7.4.1 (p.135, l.49) implies that 2 PHYs might establish link simultaneously. This seems to imply that implementers may use various configurations including ones that have completely separate wires for KX, KX4 and KR - although it is unclear how autoneg would operate in that case.

SuggestedRemedy

Add the following
73.1 Multiple PHY configurations
In all cases where multiple PHY types are present sharing an MDI, all of the PHYs shall share the same electrical connection and only one differential lane shall be used for autonegotiation. If one of the PHY types is 10GBASE-KX4 then serial PHY types shall share lane 1 of the MDI. If both serial PHY types are present then they shall share the same differential pair of electrical connections.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
There is no indication that multiple PHYs "share" an MDI. 73.3 says a single MDI might have multiple PHYs that can be connected to it but it is clear that only one PHY can be connected to the MDI at a time: AN provides a mechanism to control "connection of a single MDI to a single PHY type, where more than one PHY type may exist." 73.3 lines 34 to 36.

Add the following to 73.3:
When the MDI supports multiple lanes (e.g. for operation of 10GBASE-KX4), then lane 1 of the MDI shall be used for autonegotiation and for connection of any single lane PHYs (e.g. 100BASE-KX or 10GBASE-KR).

Cl **73** *SC* **73.5.1** *P* **129** *L* **15** # 38

BARRASS, HUGH Individual

Comment Type **T** *Comment Status* **A**

The DME cannot be transmitted when any of the PHYs are operating, therefore the statement is untrue.

SuggestedRemedy

Change "local devices operating in" to "local devices capable of operating in."

Response *Response Status* **C**

ACCEPT.

Cl **73** *SC* **73.6.4** *P* **133** *L* **16** # 37

BARRASS, HUGH Individual

Comment Type **T** *Comment Status* **A**

It is not clear why the heading "minimum requirement" is used for the column. In terms of the speed and number of lanes it seems to be a complete requirement - it would be erroneous to exeed the speed or number of lanes. If it implicitly includes other requirements (such as 8b/10b encoding) then the minimum is much higher.

SuggestedRemedy

Change "minimum requirement" to "requirement"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE. Actually, the content of that column seems more descriptive than a statement of requirements - the requirements for each are a lot more than data rate and number of lanes.

Delete the column since any reader who has gotten to this table should already understand that and the information can be determined from the technology name.

Cl **73** *SC* **73.6.4** *P* **133** *L* **7** # 81

LAW, DAVID J Individual

Comment Type **T** *Comment Status* **A**

Subclause 73.6.4 'Technology Ability Field' states 'Technology Ability Field (A[24:0]) is a 25-bit wide field' which contradicts the definition of 'Technology Ability Field' found in subclause 1.4.335, which was most recently updated by IEEE Std 802.3an-2006. It currently reads 'Within IEEE 802.3, a seven bit field in the Auto-Negotiation base page that is used to indicate the abilities of a local station, such as support for 10BASE-T, 100BASET4, and 100BASE-TX, as well as full duplex.'

SuggestedRemedy

Updated the definition found in subclause 1.4.335.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Delete the Selector Field definition and Technology Ability Field definitions. Field names don't seem to be things that are broad enough to need to be in the definitions clause. The fields and bits in messages have not been consistantly treated this way. For example, the Extended Next Page Bit was not added to definitions. Also the fields in the MMD message, Function field and DEVAD field, were not included in definitions.

Cl **73** *SC* **73.6.4** *P* **133** *L* **7** # 82

LAW, DAVID J Individual

Comment Type **E** *Comment Status* **R**

Typo.

SuggestedRemedy

Suggest that 'Technology Ability Field ..' should be changed to read 'The Technology Ability Field ..'.

Response *Response Status* **C**

REJECT. Putting "The" here would be inconsistent with the style of field definitions in this Clause and the rest of the standard. See 28.2.1.2.2 and the other subclauses of 73.6.

Cl **73** *SC* **73.7.4.1** *P* **135** *L* **48** # 14

MOORE, CHARLES E Individual

Comment Type **GR** *Comment Status* **A**

The text given implies that parallel detection should be attempted before DME and that all port types be tested simultaneously. The first is undesirable and the second will be unfeesible in many systems. Also the spec requires that parallel detection of 10GBASE_KR be tried if the port type is available. Some suppliers may feel that this could lead to false positive detection if there is high but allowed amounts of crosstalk. Parallel detection of 10GBASE_KR should be optional or possibly not allowed.

SuggestedRemedy

replace:
"Prior to detection of DME pages, the Receive Switch shall direct MDI receive activity to the 1000BASE-KX, 10GBASE-KX4 and 10GBASE-KR PHYs, if present. If at least one"
with:
"A local device shall provide parallel detection for 1000BASE-KX and 10GBASE-KX4 if it supports those PHYs. It may provide parallel detection for 10GBASE-KR. Parallel detection shall be performed by directing the MDI receive activity to the the PHY. This detection may be done in sequence between detection of DME pages and detection of each supported PHY. If at least one...."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Replace the text with:
"A local device shall provide parallel detection for 1000BASE-KX and 10GBASE-KX4 if it supports those PHYs. Parallel detection is not performed for 10GBASE-KR. Parallel detection shall be performed by directing the MDI receive activity to the the PHY. This detection may be done in sequence between detection of DME pages and detection of each supported PHY. If at least one...."
In Figure 73-11 Arbitration state diagram, delete sync_status_KR from the transition from ABILITY DETECT to LINK STATUS CHECK.
Remove any other text on parallel detect for 10GBASE-KR.

Also, the links for link_status and sync_status are entirely broken. The both link to Clause 28 which defines link_status for its PHYs but not backplane PHYs and doesn't define sync_status at all.
Actual indication of the backplane PHYs being ready to operate is :
for 10GBASE-KX4: sync_status = align_status = OK
for 10GBASE-KR: PCS_status = true
for 10GBASE-KX: sync_status = OK
Change all instances of sync_status in Clause 73 to link_status. Change the value that indicates the link is operational to link_status=OK. In 73.9.1.1 define link_status to be OK for 10GBASE-KR when PCS_status=true.

Cl **73** *SC* **73.7.4.1** *P* **135** *L* **48** # 31

THALER, PATRICIA A Individual

Comment Type **TR** *Comment Status* **A**

This text is overly specific. It is not necessary to specify that parallel detect and DME detect. The state machines don't require an order and it would not be possible to tell externally if this ordering "shall" was met.

SuggestedRemedy

Change to indicate that parallel detection and DME page detection do not have a required order. I expect Charles Moore to submit a suggested text change to accomplish this.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE. See 14

Cl **73** *SC* **73.7.4.1** *P* **135** *L* **48** # 132

FRAZIER, JR., HOWARD M Individual

Comment Type **TR** *Comment Status* **A**

Parallel detect for 1000BASE-KR can be fooled by crosstalk.

SuggestedRemedy

Make parallel detect optional for 1000BASE-KR, or make it foolproof by reducing the crosstalk, increasing the minimum receive signal level, or using out of band signalling.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE. See 14

Cl **73** *SC* **73.7.4.1** *P* **135** *L* **48** # 21

THALER, PATRICIA A Individual

Comment Type **TR** *Comment Status* **A**

The text here makes parallel detection of 10GBASE-KR mandatory. Because the maximum crosstalk allowed is extremely close to the minimum received signal level for 10GBASE-KR and it is possible to be coupled well enough to a crosstalk signal to establish sync, reliable parallel detection cannot be assured and it should not be mandatory.

SuggestedRemedy

At a minimum, make parallel detection optional for 10GBASE-KR.
My preferred solution would be to add text indicating that 10GBASE-KR parallel detection should only occur when supplemented by an implementation-dependent out of band mechanism that determines a link partner is present.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE. See 14

Cl **73** *SC* **73.7.4.1** *P* **135** *L* **49** # 36

BARRASS, HUGH Individual

Comment Type **T** *Comment Status* **R**

The use of "at least one of the" implies that more than one of these PHYs, sharing an MDI, may be detected simultaneously. This is not possible except in the case of an error condition and it should not need the use of an autoneg wait timer to resolve the issue.

SuggestedRemedy

Change "If at least one of the..." to "If one and only one of the..."
Delete "when the autoneg_wait_timer expires" from page 136, line 7.

Response *Response Status* **C**

REJECT. "at least one of" in 73.7.4.1 does not indicate that multiple PHYs can establish a link simultaneously since the arbitration state diagram requires "single_link_ready=true" before it will transition to AN GOOD CHECK. That is described in the next sentence (p. 135, l 51). If multiple links are signalling a sync_status that indicates they are ready then the state PARALLEL DETECTION FAULT is entered. It isn't clear that any signal exists that can cause multiple links to establish good sync_status simultaneously but the use of single_link_ready protects us in case there is such a signal (which might be a non-802.3 transmitter).

The text here represents the way the state machine works. The text suggested in the remedy would still imply that it was possible for multiple PHYs to be detected simultaneously.

Cl **73** *SC* **73.7.4.1** *P* **136** *L* **2** # 1

MARRIS, ARTHUR Individual

Comment Type **T** *Comment Status* **A**

The technology detected should be indicated in the AN LP base page ability register not the AN LP XNP ability register.

SuggestedRemedy

Change 'XNP' to 'base page'

Response *Response Status* **C**

ACCEPT.

Cl **73** *SC* **73.7.4.1** *P* **136** *L* **9** # 2

MARRIS, ARTHUR Individual

Comment Type **E** *Comment Status* **A**

Unnecessary capitalization

SuggestedRemedy

Change 'Fault' to 'fault'

Response *Response Status* **C**

ACCEPT.

Cl **73** *SC* **73.7.7.1** *P* **137** *L* **45** # 39

BARRASS, HUGH Individual

Comment Type **TR** *Comment Status* **R**

There is nothing in this section that indicates how the Message Code field is defined. There should be a normative reference to Annex 73A (that is only linked to this Clause by implication).

SuggestedRemedy

Add the following at the end of the paragraph:
Pages sent with the MP bit set shall conform to the Message formats defined in Annex 73A.

Response *Response Status* **W**

REJECT. The shall statements are in 73A which is a normative annex. This is the same as was done in Clause 28.

Cl **73A** *SC* **73A** *P* **196** *L* **8** # 40

BARRASS, HUGH Individual

Comment Type **TR** *Comment Status* **A**

This paragraph (and the Clause title) does not make it clear that these next page formats are for use by devices conforming to Clause 73.

SuggestedRemedy

Insert before the first sentence:
Devices using Clause 73 Autonegotiation shall use the Message Code definitions and message formats defined in this Annex.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE. There are already adequate shall statements. The context is also already set by the annex number but just to make it clear, we can add:
This Annex defines the Next Page Message code fields for devices using Clause 73 Autonegotiation.

Cl **74** *SC* **74.1** *P* **162** *L* **9** # 126

FRAZIER, JR., HOWARD M Individual

Comment Type **ER** *Comment Status* **A**

Extra period after "72" and missing period after "69".

SuggestedRemedy

Change to read: "The 10GBASE-KR PHY described in Clause 72 optionally uses the FEC sublayer to increase the performance on a broader set of back plane channels as defined in Clause 69."

Response *Response Status* **W**

ACCEPT.

Cl **74** *SC* **74.1** *P* **162** *L* **10** # 127

FRAZIER, JR., HOWARD M Individual

Comment Type **ER** *Comment Status* **A**

Ambiguous subject

SuggestedRemedy

Change "It" to "The FEC sublayer".

Response *Response Status* **W**

ACCEPT.

Cl **74** *SC* **74.10.3** *P* **178** *L* **28** # 10

DAWE, PIERS J G Individual

Comment Type **TR** *Comment Status* **R**

This FEC scheme should be exemplary, so that 10GEPON and HSSG can copy the good stuff in it. At present it isn't quite. 1. This state machine could gain and lose "lock" repeatedly (chattering) - I understand that network management systems really hate anything like this that can cause unnecessary multiple alarms. It happens around a BER of 10^-4. Compare the "signal detect" of an optical PMD, which is expected to have hysteresis, and it also cuts in/out at power levels "below sensitivity" where the BER is not acceptable. And compare Clause 49 64B/66B PCS sync which uses hi_ber to shield the system from such issues. A PCS with FEC is expected to be "better" than one without, so should hold its sync better than the plain vanilla Clause 49 PCS. Fortunately, this is easy to achieve (an early draft had it nearly right; a change to the sync-up criterion was applied, with hindsight wrongly, to the lose-sync criterion also). 2. The present state machine throws away lock unnecessarily in transient error conditions e.g. lightning strikes (or plugging a neighbouring card in?) hence taking MUCH longer than needed to recover a good link. What it should do is keep lock and de-assert FEC_SIGNAL.indication while BER >10^-4 but lock is OK.

SuggestedRemedy

In concept: there should be three states (not the states of the diagram): seeking lock, in lock with good BER (higher layers can use the data), and in lock but bad BER (higher layers can't use the data but link will recover very quickly if BER improves/burst event ends). Specifically: change requirements so that: when in lock, m consecutive correctable or uncorrectable blocks (any mix) cause FEC_SIGNAL.indication to become false yet not necessarily cause a slip; m consecutive uncorrectable blocks cause loss of sync (as at present); recovery from either (sync'd but FEC_SIGNAL.indication false) OR (out of sync) by n perfect blocks (as for initial block lock).

Response *Response Status* **W**

REJECT.

The 10GBASE-KR FEC is not intended to recover links of BER 1E-3 or 1E-4 . The FEC is to improve BER of links that are at 10E-12. The probability of bit errors during the qualification is low and the number of locations to check is high, the algorithm is optimized to quickly discard incorrect candidate start positions. Discarding a correct start position is low due to the low BER. The algorithm is designed with this assumption.

The KR link with or without FEC has comparable probability of losing lock at low BER. Refer to FEC tutorial (July 06 Plenary) for a plot showing sync time /unlock time versus BER. At low BER the state machine achieves synchronization within 0.22ms.

Cl **74** *SC* **74.10.3** *P* **178** *L* **28** # 9

DAWE, PIERS J G Individual

Comment Type **TR** *Comment Status* **R**

This state diagram is too prescriptive. It forces all implementations to a second-best algorithm. Can we do the job with words? I am aware of 1.2 and 21.5 saying how 802.3 does state diagrams but I don't believe this stops us doing the right thing; could have a flow diagram that doesn't purport to be a state diagram (as we had a few drafts ago), or use words.

SuggestedRemedy

Try to define the lock requirements in words, based on the following. If we can't, give the committee's valid reason in the response, and change state machine so that: when in lock, m consecutive correctable or uncorrectable blocks (any mix) cause FEC_SIGNAL.indication to be false yet not necessarily cause a slip; m consecutive uncorrectable blocks cause loss of sync (as at present); recovery from either (sync'd but FEC_SIGNAL.indication false) OR (out of sync) by n perfect blocks (as for initial block lock).

Response *Response Status* **W**

REJECT.

We defined the state machine so that lock will be acquired quickly and also with high assurance of a correct lock. Since the FEC is only constructed to work with low BER, Bit errors during lock are unlikely and quick rejection of bad candidate positions improves lock speed.

Since the FEC is defined for low BER, when in lock, when there are multiple uncorrectable blocks that is an indication of loss of lock and therefore a reason to start searching for a new lock. The commenters suggestion is unacceptable because it does not allow the state machine to begin search for a new position when it loses lock.

Not defining lock behaviour can lead to interoperability issues or unpredictable behaviour. For this reason all 802.3 PHYs that have lock process have lock state machines.

The consensus of the task force is using words to define the behaviour could lead to ambiguity and defining it in a state diagram makes the behaviour much more clear.

Also see response to comment #10.

Cl **74** *SC* **74.10.3** *P* **178** *L* **31** # 123
FRAZIER, JR., HOWARD M Individual

Comment Type **ER** *Comment Status* **A**

In Figure 74-8, the letters "!fec" on the transition condition from the state INVALID_PARITY appear in the wrong font.

SuggestedRemedy

Fix the font to match the rest of the diagram

Response *Response Status* **W**

ACCEPT.

Cl **74** *SC* **74.10.3** *P* **178** *L* **31** # 11
DAWE, PIERS J G Individual

Comment Type **E** *Comment Status* **A**

In the line "parity_invalid_cnt = m +" the "+" falls partly under a line of the drawing (depending on screen magnification) and can be mistaken as a "*"

SuggestedRemedy

When you fix or remove this state machine, check that any equations or similar don't lie under lines. Thanks!

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

In fig 74-8, move the equation such that it is spaced away from the vertical line.

Cl **74** *SC* **74.11.5** *P* **182** *L* **7** # 51
HEALEY, ADAM B Individual

Comment Type **E** *Comment Status* **A**

Center item label in the first three rows.

SuggestedRemedy

Per comment.

Response *Response Status* **C**

ACCEPT.

Cl **74** *SC* **74.4.1** *P* **164** *L* **23** # 98
GANGA, ILANGO S Individual

Comment Type **E** *Comment Status* **A**

In figure 74-2, delete the additional double line for tx_data-group

SuggestedRemedy

As per comment

Response *Response Status* **C**

ACCEPT.

Cl **74** *SC* **74.7.3** *P* **167** *L* **48** # 128
FRAZIER, JR., HOWARD M Individual

Comment Type **ER** *Comment Status* **A**

Awkward gramar and incomplete sentence.

SuggestedRemedy

Change first paragraph of this subclause to read: "The FEC sublayer does not decrease the symbol rate of the PCS, nor does it increase the baud rate of the PMD sublayer. Instead, the FEC sublayer compresses the sync bits from the 64b/66b encoded data provided by the PCS to accommodate the addition of 32 parity check bits for every block of 2080 bits."

Response *Response Status* **W**

ACCEPT.

Cl **74** *SC* **74.7.4.4** *P* **170** *L* **1** # 129
FRAZIER, JR., HOWARD M Individual

Comment Type **ER** *Comment Status* **A**

Should start a new sentence.

SuggestedRemedy

Delete "then," and capitalize "If".

Response *Response Status* **W**

ACCEPT.

Cl **74** *SC* **74.7.4.5** *P* **171** *L* **24** # 130

FRAZIER, JR., HOWARD M Individual

Comment Type **ER** *Comment Status* **A**

Don't need an apostrophe in "XOR'ing".

SuggestedRemedy

Change to "XORing", or better yet, change to "first performing an XOR operation of".

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Rephrase the sentence in line 24 to read as, "first performing an XOR operation of...".

Cl **74** *SC* **74.7.4.5.1** *P* **172** *L* **52** # 131

FRAZIER, JR., HOWARD M Individual

Comment Type **TR** *Comment Status* **A**

Don't use the word "guaranteed". The subsequent sentence with the "shall" statement provides the appropriate language.

SuggestedRemedy

Delete the first sentence of the last paragraph of this subclause.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Rephrase the first sentence of the last paragraph of this subclause as follows:

"The FEC code (2112, 2080) and its performance is specified in 74.7.1."