

CI 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.

CI 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.

CI **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.

CI **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.

CI 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).

CI 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

CI 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

CI 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 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 72.1** **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 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), rephrase 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 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 **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 Amaz and IImax can be readily discerned.

Response Response Status **W**

ACCEPT IN PRINCIPLE.

Amaz 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 **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 Amaz and IImax can be readily discerned.

Response Response Status **W**

ACCEPT IN PRINCIPLE.

Refer to comment #111.

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 Amaz and IImax can be readily discerned.

Response Response Status **W**

ACCEPT IN PRINCIPLE.

Refer to comment #111.

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 **70.7.2.1** 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 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 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 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 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 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 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 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 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 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 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 74.7.3 P 167 L 48 # 128
 FRAZIER, JR., HOWARD M Individual

Comment Type ER Comment Status A

Awkward grammar 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."

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 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.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.4.1** 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 **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 **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 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 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 45.2.7.8** **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 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 45.5.3.2** **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 45.5.10.8** **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 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 69.2.3** **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 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 70.7.1** **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 70.7.2.1** **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 tolerance test shall be the jitter pattern test frame as defined in 59.7.1. The receiver shall satisfy the requirements 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 tolerance test shall be the continuous jitter test pattern as defined in Annex 48A.5. The receiver shall satisfy the requirements 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 tolerance 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 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 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. Transmitter 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.

CI 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 receiver shall operate with a BER of better than 10^{-12} when receiving a compliant transmit signal, as defined in 70.7.1, though a compliant 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.

CI 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 receiver shall operate with a BER of better than 10^{-12} when receiving a compliant transmit signal, as defined in 71.7.1, though a compliant 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.

CI 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 sentence 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 sentence beginning 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."

CI 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 therefore 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) indicate 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 coefficient status field indicates not_updated.'

See comment 229

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 too 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 72.7.1.7 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 72.7.1.10 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 72.7.2.1 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 receiver shall operate with a BER of better than 10^{-12} when receiving a compliant transmit signal, as defined in 72.7.1, though a compliant 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 72.8 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 receiver 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 / receiver 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 appropriately add in to all of the "it is recommended that" phrases "for 10GBASE-KR xxx shall meet".

Response Response Status W

REJECT.

Please refer to comment 16

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 receivers meeting BER requirements 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 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 inconsistent. 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 by which they can check their channel against to see if they are meeting the recommendations. The second is so a systems analyst and architect can build a model that they can use to design their receiver to operate with. It is this later reason that drives the need for consistent 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:

100BASE-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 100BASE-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.

100BASE-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 consensus 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.

<i>Cl</i> 69B	<i>SC</i> 69B.4	<i>P</i> 188	<i>L</i> 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 operate when separately manufactured components are combined to construct the system. This interoperability requirement for a standard can only be ensured if each of the system components are fully specified. Only when each piece is fully specified can someone assembling the system from separately manufactured components be assured the resultant system will work.

This draft has broken down the system into three separate and distinct 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 therefore 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 control 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 observed. Each end of the channel is exposed whereby test equipment can be made to inject signals into it, control, and observe the signals at the output end, observed. The beginnings of a specification for the channel have been started, however, the task force has elected not to make it mandatory that an 802.3ap system meet these, or any, channel specifications.

Although the receiver is very easily controlled, its inputs are readily available to stimulate with test signals, it is very difficult to observe. Even if the receiver specification is encumbered with internal nodes exposed for test purposes the fact is the function of the receiver 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 receiver's function is to count how many times it functions properly. This is called Bit Error Ratio, BER.

The current specification for the receiver measures the receiver's performance by measuring the BER it produces for a vastly reduced subset of channels as recommended by this Annex. The interference tolerance 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 expected 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.

Suggested Remedy

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.

CI 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.'

CI 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 $1.29 \pm 10\%$ and $2.57 \pm 10\%$ 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 $1.29 \pm 10\%$ and $2.57 \pm 10\%$ 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 72.6.6 P 95 L 10 # 231
 GHIASI, ALI Individual

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

It is not specified 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 72.7.2.1 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 characteristics.

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 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 45.5.10.8 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 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 frequency

- 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 72.7.1.9 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 can both pass but the link will fail.

Response Response Status W

REJECT.

refer to comment 260

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 a standard where the user can't verify their link will work and with how much margin is against IEEE standard practice.

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.